

Robotics PhD Requirements

Post-B.S. PhD requirements: Complete a minimum of 30 Course credits, 3 seminar credits, and 14 dissertation credits for a total of 47 credits.

Students stacking upon a University of Utah MS degree can waive up to 21 approved credits, resulting in 26 credits required post MS.

Students stacking upon an MS degree from a university besides the University of Utah can waive up to 18 approved credits.

Course Number	Course Title	Cross-listings	Offered
CORE COURSE REQUIREMENT (Complete at least one course from each core area):			
Robot Mechanics Core Area (Required):			
ROBOT 6000	Robotics I: Mechanics (formerly Intro to Robotics)	CS 6310, ECE 6650, ME EN 6220	Fall
Robot Control Core Area (Required):			
ROBOT 6100	Robotics II: Control (formerly Intro to Robot Control)	CS 6330, ECE 6651, ME EN 6230	Spring
Cognition Core Area (Pick one):			
ROBOT 6200	Motion Planning	CS 6370, ME EN 6225	Spring
CS 6300	Artificial Intelligence		Fall
Perception Core Area (Pick one):			
CS 6640	Image Processing	BME 6640, ECE 6532	Fall
CS 6320	Computer Vision		Fall
ELECTIVE COURSE REQUIREMENT: Select 3 classes total from at least two different categories; core courses listed above that are not used to fulfill a core area requirement may also be considered:			
	Course Title	Cross-listings	Offered
Robot Mechanics Category Electives:			
ROBOT 7000	Manipulation and Mobility	ME EN 7230, CS 7310	Spring, odd years
ROBOT 7010	System ID for Robotics	CS 7320, ME EN 7220	Fall, odd years
Robot Control Category Electives:			
ME EN 6200 or ECE 6615	Classical Control Systems		Fall
ECE 6670	Control of Electric Motors		Spring
ME EN 6210 or ECE 6652 or CH EN 620	State Space Control		Spring
ME EN 7200	Nonlinear Control		Fall, even years
ME EN 7210	Optimal Control		Spring, even years
ECE 6570	Adaptive Control		Varies
Cognition Category:			
CS 6350	Machine Learning		Fall, Spring
CS 6958	Robot Learning (currently special topics)		Varies
Perception Category:			

	CS 7640	Advanced Image Processing		Varies
	CS 6353	Deep Learning for Image Analysis		Fall
	ECE 6530	Digital Signal Processing		Fall
	Human-Robot Interaction Category:			
	CS 6360	Virtual Reality		Fall
	ROBOT 7400	Haptics for VR, Teleoperation, Physical Human-Robot Interaction	ME EN 7240	Fall, odd years
	ROBOT 6400	Neuro-Robotics (will be cross listed with BME 6440)	BME 6440, ECE 6654	Fall
	Robot Design Category:			
	ROBOT 6500	Advanced Mechatronics	ME EN 6240	Spring, even years
	ROBOT 6510	Wearable Robotics (currently special topics class)		Fall, even years
	ECE 6780 or CS 6780	Embedded System Design		Spring
	ECE 6960	Robotic Millisystems		Fall, odd years
	CS 6956	Medical Robotics (currently special topics)		Spring, even years
	<p>Allied courses (9-10 credits) to reach the 30-credit hour coursework minimum requirement may be chosen from core courses, pre- approved electives, supporting electives, lecture-based engineering/science courses (e.g., excluding seminars, projects, thesis), or approved non-engineering/science courses. Subject to supervisory committee approval.</p>			
		Course Title	Cross-listings	Offered
	Supporting Elective Category:			
	ME EN 6035	Design of Experiments		Spring
	ME EN 6100	Ergonomics		Fall
	ECE 6540	Estimation Theory		Spring, even years
	CS 6540	Human-Computer Interaction		Fall
	ME EN 6410	Intermediate Dynamics		Spring, even years
	CS 6340	Natural language processing		Fall
	ME EN 6205	System Dynamics		Fall
	SEMINAR REQUIREMENT			
	ME EN 6890 or ECE 6900 or CS 7930	Department seminar—Enroll in the department graduate seminar 1 associated with your thesis adv		Fall, Spring
	ROBOT 6800	Robotics Seminar (enroll two semesters for 1 credit each s	CS 7942, ECE 6868, ME EN 6892	Fall, Spring
	ROBOT 6800	Robotics Seminar (enroll two semesters for 1 credit each s	CS 7942, ECE 6868, ME EN 6892	Fall, Spring
	DISSERTATION REQUIREMENT (14 cr			
	ROBOT 7970	PhD Dissertation		