

Robotics, MS

For program contact information, please visit this website (<https://coe.northeastern.edu/academic-programs/ms-robo/>).

The multidisciplinary Master of Science program in robotics is offered by the College of Engineering and the Khoury College of Computer Sciences. The program is designed to provide students comprehensive training in algorithms, sensors, control systems, and mechanisms used in robotics.

Gordon Institute of Engineering Leadership

Master's Degree in Robotics with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Robotics in addition to earning a Graduate Certificate in Engineering Leadership (<http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-leadership-graduate-certificate/>). Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 40-semester-hour degree and certificate will require 24 semester hours of advisor-approved robotics technical courses.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Code	Title	Hours
Mechanical Engineering		
Complete one of the following:		4
ME 5250	Robot Mechanics and Control	
ME 5659	Control Systems Engineering	
Electrical and Computer Engineering		
Complete one of the following:		4
EECE 5550	Mobile Robotics	
EECE 5552	Assistive Robotics	
EECE 5554	Robotics Sensing and Navigation	
Computer Science		
Complete one of the following:		4
CS 5180	Reinforcement Learning and Sequential Decision Making	
CS 5335	Robotic Science and Systems	

Concentrations

Complete one of the following concentrations:

- Mechanical Engineering (p. 1)
- Electrical and Computer Engineering (p. 2)
- Computer Science (p. 2)

MECHANICAL ENGINEERING

Code	Title	Hours
Students in the mechanical engineering concentration follow the College of Engineering co-op policies.		
Required Course		
Complete one additional ME course not used to fulfill the core requirements:		4
ME 5250	Robot Mechanics and Control	
ME 5659	Control Systems Engineering	
Complete one of the following options:		
<i>Coursework Option</i>		
Complete 16 semester hours of courses from the elective course list. (p. 2)		16
<i>Project Option</i>		
ME 7945	Master's Project	4
Complete 12 semester hours of courses from the elective course list. (p. 2)		12
<i>Thesis Option</i>		

ME 7990	Thesis	8
Complete 8 semester hours of courses from the elective course list. (p. 2)		8

ELECTRICAL AND COMPUTER ENGINEERING

Code	Title	Hours
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Students in the electrical and computer engineering concentration follow the College of Engineering co-op policies.

Required Course

Complete one additional EECE course not used to fulfill the core requirements: 4

EECE 5550	Mobile Robotics	
EECE 5552	Assistive Robotics	
EECE 5554	Robotics Sensing and Navigation	

Complete one of the following options:*Coursework Option*

Complete 16 semester hours of courses from the elective course list. (p. 2) 16

Project Option

EECE 7674	Master's Project	4
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Complete 12 semester hours of courses from the elective course list. (p. 2) 12

Thesis Option

EECE 7990	Thesis	8
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Complete 8 semester hours of courses from the elective course list. (p. 2) 8

COMPUTER SCIENCE

Code	Title	Hours
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Students in the computer science concentration follow the Khoury College of Computer Sciences co-op policies.

Required Course

Complete one additional CS course not used to fulfill the core requirements: 4

CS 5180	Reinforcement Learning and Sequential Decision Making	
CS 5335	Robotic Science and Systems	

Complete one of the following options:*Coursework Option*

Complete 16 semester hours of courses from the elective course list. (p. 2) 16

Project Option

CS 8674	Master's Project	4
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Complete 12 semester hours of courses from the elective course list. (p. 2) 12

Thesis Option

CS 8674	Master's Project	4
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CS 7990	Thesis	4
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Complete 8 semester hours of courses from the elective course list. (p. 2) 8

Elective Course List

Code	Title	Hours
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CS 5097	Mixed Reality	
CS 5100	Foundations of Artificial Intelligence	
CS 5170	Artificial Intelligence for Human-Computer Interaction	
CS 5330	Pattern Recognition and Computer Vision	
CS 5340	Computer/Human Interaction	
CS 5800	Algorithms	
CS 6120	Natural Language Processing	
CS 6140	Machine Learning	
CS 6350	Empirical Research Methods	
CS 7140	Advanced Machine Learning	
CS 7150	Deep Learning	
CS 7180	Special Topics in Artificial Intelligence	
DS 5220	Supervised Machine Learning and Learning Theory	
EECE 5550	Mobile Robotics	

EECE 5552	Assistive Robotics
EECE 5554	Robotics Sensing and Navigation
EECE 5580	Classical Control Systems
EECE 5639	Computer Vision
EECE 5642	Data Visualization
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 7150	Autonomous Field Robotics
EECE 7323	Numerical Optimization Methods
EECE 7337	Information Theory
EECE 7370	Advanced Computer Vision
EECE 7397	Advanced Machine Learning
EECE 7398	Advanced Special Topics in Electrical and Computer Engineering (Legged Robots)
IE 6500	Human Performance
IE 7280	Statistical Methods in Engineering
IE 7315	Human Factors Engineering
IE 7615	Neural Networks and Deep Learning
ME 5240	Computer Aided Design and Manufacturing
ME 5245	Mechatronic Systems
ME 5250	Robot Mechanics and Control
ME 5654	Elasticity and Plasticity
ME 5655	Dynamics and Mechanical Vibration
ME 5659	Control Systems Engineering
ME 5665	Musculoskeletal Biomechanics
ME 6200	Mathematical Methods for Mechanical Engineers 1
ME 6260	Introduction to Microelectromechanical Systems (MEMS)
ME 7247	Advanced Control Engineering

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required