

# MINOR IN ROBOTICS

The Schools of Aerospace Engineering, Biomedical Engineering, Electrical and Computer Engineering, Interactive Computing, and Mechanical Engineering offer a minor in robotics for students majoring in any discipline.

The Robotics Minor provides a concentrated experience in the multidisciplinary field of robotics.

## Program of Study

Code	Title	Credit Hours
<b>Required Robotics Courses</b>		
Select one course:		3
CS 3630	Introduction to Perception and Robotics	
ECE 4560	Introduction to Automation and Robotics	
ME 4451	Robotics	
BMED 4739	Medical Robotics	
<b>Elective Courses</b>		
Choose at least one course from 2 of the 4 core categories:		12
<b>Autonomy</b>		
AE 4552	Introduction to Humans & Autonomy	
CS 3600	Introduction to Artificial Intelligence	
CS 4641	Machine Learning	
CS 4649	Robot Intelli Planning	
ECE 4555	Embedded and Hybrid Control Systems	
<b>Controls</b>		
AE 3531	Control System Analysis and Design or ECE 3!Feedback Control Systems or ME 44Control of Dynamic Systems	
ECE 4550	Control System Design	
ME 4012	Modeling and Control of Motion Systems	
ME 4405	Fundamentals of Mechatronics	
<b>Mechanics</b>		
AE 2220	Dynamics or CEE 2020 Dynamics or ME 2200 Dynamics of Rigid Bodies	
AE 3530	System Dynamics and Vibration	
ME 4189	Structural Vibrations	
<b>Perception</b>		
BMED 3500	Biomedical Sensors and Instrumentation	
BMED/ECE 4781	Biomedical Instrumentation	
BMED/ECE 4783	Introduction to Medical Image Processing	
CS 4476	Introduction to Computer Vision	
CS 4616	Pattern Recognition	
ECE 2026	Introduction to Signal Processing	
ECE 4180	Embedded Systems Design	
ECE 4271	Applications of Digital Signal Processing	
<b>Total Credit Hours</b>		<b>15</b>

AE/BMED/ME/ECE/CS 4699 Undergraduate Research in robotics or autonomous systems (3 hours) may be used to fulfill one of the 4 core requirements. This research must be completed with a robotics faculty member and requires a final report that highlights its linkage to the respective core: Autonomy, Controls, Mechanics, and Perception.

Additional Restrictions on the 15 hours of credit for the Robotics Minor:

- At least two courses must be taken outside of the student's home school. Cross-listed courses, such as those marked with an \* in the list above, cannot count as being "outside the home school" for any of the students who are from the schools that cross list that course.
- Courses must be taken from two or more schools.
- All courses from the minor must be passed with a grade of C or higher.
- No more than one 2000-level course may be used towards the minor.
- No course that is required (by name and number) in the student's major discipline can be counted towards the student's minor. No course that is considered equivalent to a required course in the student's major is allowed for the minor.
- No course counted towards the Robotics Minor can be used for any other undergraduate minor or certificate.