

Course Number	CS 404	Course Title	Autonomous Mobile Robots				
Semester Hours	3	Course Coordinator	Henry Hexmoor				
Catalog Description	This course is a comprehensive introduction to modern robotics with an emphasis on autonomous mobile robotics. Fundamental of sensors and actuators as well as algorithms for top level control are discussed. Multi-robotics and human-robot interaction issues are explored. A group project is an integral part of this course.						
Textbooks							
FA20							
Hexmoor, H. (2013). <i>Essential Principles for Autonomous Robotics</i> , Morgan and Claypool. ISBN: 9781627050586.							
References							
Course Learning Outcomes							
<ul style="list-style-type: none"> • To understand the robotic platforms and their limitations. • To learn to program mobile robots. • To design automations solutions using mobile robots. 							
Assessment of the Contribution to Student Outcomes							
Outcome →	1	2	3	4	5	6	7
Assessed →	X	X	X				X
Prerequisites by Topic							
CS 330 with a grade of C or better or graduate standing.							

Major Topics Covered in the Course

1. Introduction {2 classes}
2. Robot body {4 classes}
3. Autonomy {2 classes}
4. Sensing and Perception {6 classes}
5. Control Loop {4 classes}
6. Locomotion, and Kinematics and mapping {6 classes}
7. Advanced control loop {4 classes}
8. Human-robot interaction {2 classes}
9. Multi-robotics: Formations, self-organization, collaboration {10 classes}

NOTE: When course is taken as 500-level credit (CS 591 “Special Topics”), there will be additional requirements such as a research project.