

# Course Outline

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## 1. Document Information

<b>Degree Program</b>	Computer Science
<b>Course Number</b>	CS 404
<b>Course Title</b>	Autonomous Mobile Robots
<b>Semester Hours</b>	3
<b>Course Coordinator</b>	Henry Hexmoor
<b>Revision Term</b>	Spring 2020
<b>Latest Revision</b>	Fall 2020

## 2. 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.

## 3. Textbooks

- Hexmoor, H. (2013). Essential Principles for Autonomous Robotics, Morgan and Claypool. ISBN: 9781627050586.

## 4. References

## 5. Course Learning Outcomes

- To understand the robotic platforms and their limitations.
- To learn to program mobile robots.
- To design automations solutions using mobile robots.

## 6. Assessment of the Contribution to Student Outcomes

Outcome	1	2	3	4	5	6
Assessed		X		X		X

## 7. Prerequisites by Topic

CS 330 with a grade of C or better or graduate standing.

## 8. 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}