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**


**References**


**Course Learning Outcomes**

- 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**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessed</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Prerequisites by Topic**

CS 330 with a grade of C or better.
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}