

# Mobile Robots EECN30169/535317

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**II. Time :** (Fri) BCD , **Location:** EE632 Lab

**III. Office Hours:** by appointment

**IV. Topics :**

This course is about design and applications of mobile robots. The course content includes theoretical lectures and hands-on experimental work. In the lectures, basic theories about mobile robot are covered. In the experimental part, students will apply the learned theory to build a mobile robot step by step. The robot which will be used for the final robot contest and term project demonstration. The topics include motion control, robotic sensors and interfacing, robot self-localization and behavior-based programming. Hands-on practices will be carried out in an organized manner using the self-constructed robot. At the final stage of the course, each and every student team will complete a robot for the final robot hockey contest and give a cool-robot show. All the robot parts will be supplied in the class. The students will build the robot and develop the programs gradually for the robot contest. The major topics include:

1. Introduction
2. Embedded computing platform
3. DC motor control, robot motion control
4. Robot sensing
5. Mobile robot locomotion
6. Behavior-based control
7. Behavior Fusion
8. Localization
9. Obstacle avoidance
10. Robot hockey contest (with 4 hands-on assignments)

**V. Teaching materials :**

- Mobile Robots course notes

References:

- Introduction to Autonomous Mobile Robots by Roland Siegwart, Illah Nourbakhsh and Davide Scaramuzza, 2<sup>nd</sup> Edition, The MIT Press, 2011
- Mastering ROS for Robotics Programming, Lentin Joseph, PACKT Publishing 2015

**VI. Grading guide :**

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| 1. Hands-on assignments x4 | 60% |
| 2. Robot Hockey Contest    | 20% |
| 3. Term Project            | 20% |