Mobile Robots EECN30169/535307

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

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 theory about mobile robot will be covered. In the experimental part, students will apply the learned theory to build a mobile robot, which will be used for the final robot contest. The topics include DC motor and motion control, robotic sensors and interfacing, robot locomotion and behavior-based programming. Hands-on practices will be carried out in an organized manner using the constructed robot. At the final stage of the course, each and every student team will complete a robot for the final robot hockey contest. All the materials will be supplied in the class. The students will build the robot and develop the necessary programs gradually for the final contest. A term project will be assigned for each team to present a robot show by using the same robot hardware, but with extra perception sensors. The major chapters include:

1. Introduction
2. Embedded computing platform and ROS programming environment
3. DC motor control, mobile robot motion control
4. Robot sensors
5. Mobile robot mechanism
6. Behavior-based control design
7. Behavior Fusion
8. Localization
9. Obstacle avoidance
10. Robot hockey contest (including 4 hands-on assignments)

V. Teaching materials：

1. Mobile Robots course notes

References:

1. Introduction to Autonomous Mobile Robots by Roland Siegwart, Illah Nourbakhsh and Davide Scaramuzza, 2nd Edition, The MIT Press, 2011
2. Mastering ROS for Robotics Programming, Lentin Joseph, PACKT Publishing, 3rd Edition 2021, eBook

VI. Grading guide：

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