EEE 187: Robotics
Fall 2019

Instructor: Fethi Belkhouche
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Meeting Time: Tuesday, Thursday: 10:30am–11:45am
Meeting Place: SQU 301
Lab Meeting Time: Wednesday: 2:00am–4:40am and Wednesday: 5:00pm–7:40pm
Lab Meeting Place: RVR 4005
Office Hours: Tuesday 1-2pm, Thursday 9-10am,
Reading:
Introduction to Autonomous Mobile Robots by R. Siegwart, I. Nourbakhsh and D. Scaramuzza, MIT Press.

Course description from catalog
Lecture introduces principles of robotics and design of robot systems. Includes robot architectures, sensing position/velocity, digital circuit noise, actuator and path control, robot coordinate systems, kinematics, differential motion, computer vision/architectures, and artificial intelligence. Laboratory will apply lecture theory in design experiments utilizing five degree-of-freedom robots, an industrial robot, and vision systems. Prerequisites: EEE 180 or equivalent, or instructor permission.

Learning outcomes
After successfully completing the course, students will be able to:
• Devise mathematical models for different classes of robotic systems such as robotic manipulators and wheeled mobile robots
• Describe and implement path planning, estimation under uncertainty, and robot learning methods and algorithms.
• Build robotic systems, and design and implement feedback control laws.
• Use contemporary simulation tools to simulate robotic systems and methods.
• Communicate effectively in oral and written forms.
• Work effectively in a team

Grading policy
Student performance in this course is evaluated based on homework and quizzes, exams, and labs, weighted as follows:
• Homework and quizzes:11%
• Test 1: 16%
• Test 2: 16%
• Final Exam: 17%
• Lab: 40%

Homework and Quizzes
Homework is assigned weekly and due in one week. Late homework will be returned without a grade. Matlab will be used to solve certain homework problems.
Exams

There will be two exams with in-class and take-home parts. The date of the exams will be announced in class. Make-up exams will not be given except in extraordinary circumstances.

Lab activities

Six activities are carried out in the lab. The lab grade covers the design, the reports, and the final presentation. Details about the weight and the reports length will be provided later. Activities 1 through 5 will be carried out by teams of two. Teams of 3 or 4 are allowed for activity 6. The activities are listed below.

- Constructing and calibrating your robot
- Open loop motion planning
- Basic line following
- Motion planning
- The race, losing team will destroy their robot
- Open-ended project

Letter grade

Letter grade intervals are:

- **A**: $A \geq 94$; $90 \leq A- < 94$
- **B**: $87 \leq B+ < 90$; $83 \leq B < 87$; $80 \leq B- < 83$
- **C**: $77 \leq C+ < 80$; $73 \leq C < 77$; $70 \leq C- < 73$
- **D**: $67 \leq D+ < 70$; $63 \leq D < 67$; $60 \leq D- < 63$
- **F**: Below 60

Note

Syllabus is subject to change.