ECE ****: Robot Motion Planning

INSTRUCTOR:
Shalabh Gupta  
Associate Professor  
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Office: ITEB Room 341  
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Office Hours: TBD

CLASSES: TBD

TEXT BOOK: The course will provide lecture notes. Suggested Reading:


PREREQUISITES: TBD.

DESCRIPTION:
The course will cover various aspects of robotics. Topics include

• Review of Graphs and Trees
• Introduction to Motion Planning and Application Examples
• Robot Sensing and Localization
• The Bug Algorithms
• Potential Field-based Planning
• Workspace Decomposition and Configuration Space
• Shortest Path Search Algorithms on Graphs (Dijkstra’s and A*)
• Sampling-based Motion Planning (Probabilistic Roadmaps, RRT, RRT* and variants, Informed Sets)
• Coverage Path Planning (Grid based Methods, Cellular Decomposition Methods)
• Planning in Dynamic Environments

PROJECT: All students have to do a class project which could be hardware design or simulation based. Project topics will be approved and assigned after discussion with the instructor.

GRADING:
Homeworks 20%  
Midterm Exam 30%  
Final Exam 20%  
Project 30%  
Total 100%

LOGISTICS AND GENERAL RULES:
• As needed, the necessary course materials will be available at http://huskyct.uconn.edu.
• Homework assignments will be due back on the due date mentioned on each homework.
• Each assignment may include computer problems. The computer problems shall be implemented in
MATLAB. MATLAB is available in the Engineering Learning Centers in ITEB.

• Make-up exams will be given only in case of illness or emergency condition, and a written note from the doctor or University Infirmary is required stating that the student is too sick to take the exam.