

# Honors 1000: Programming Intelligent Robots

## Spring 2015 Syllabus

Prof. Christopher Crick

### **Abstract**

Programming Intelligent Robots is an introduction to fundamental topics in autonomous robot control. This course focuses on the development of brains for robots. That is, given a machine with sensing, actuation, and computation, how do we develop programs that allow the machine to function autonomously? This class will cover both specific problems and algorithms related to intelligent robots, as well as more general programming paradigms and languages that can be used in a wide variety of application contexts.

### **Professor**

- Dr. Christopher Crick
- Office: MSCS 213
- Lab: MSCS 214
- Office hours: MW 10-11:30, or by appointment, or walk-in
- Email: chriscrick@cs.okstate.edu

### **Course Meetings**

- W 4:30 MSCS 203W

### **Grading**

The course will have five assignments and culminate in a 2-on-2 robot soccer tournament (which also counts as an assignment, though winning the tournament is not necessary for credit). Each assignment will be demonstrated to Prof. Crick during its due week; if performance is reasonable, credit will be earned for that assignment. If not, the demo can be repeated a few days later after additional tweaking.

### **Grade Breakdown**

- A: Six assignments completed satisfactorily.
- B: Five assignments completed satisfactorily.
- C: Four assignments completed satisfactorily.
- D or F: Three or fewer assignments completed.

## Academic integrity

Academic integrity is taken very seriously. You are permitted (and indeed encouraged) to discuss the course material with fellow students in general terms, but the programs you write must be your own. **Code copied from each other or found on the net will result in an automatic zero for the assignment**, and depending on the egregiousness of the offence may result in earning an 'F!' for the course and facing academic disciplinary measures.

Certain of the assignments will involve working in teams. You will be expected to share information with each other about how your code works and what kind of data will be exchanged, but your robot will run your own code that you wrote yourself.

## Class schedule

- January 14 (W): Autonomous robotics and robot middleware
- January 21 (W): Robot control loop. Due: Installation and ROS tutorials.
- January 28 (W): Finite state automata.
- February 4 (W): PID controllers. Due: Prison break.
- February 11 (W): Computer vision I.
- February 18 (W): Computer vision II. Due: Robot puppy.
- February 25 (W): Coordinate spaces.
- March 4 (W): Path planning I.
- March 11 (W): Path planning II. Due: Robot tag.
- March 18 (W): Spring Break (**No class**).
- March 25 (W): Particle filters.
- April 1 (W): Localization I.
- April 8 (W): Localization II. Due: Where am I?
- April 15 (W): Robot soccer.
- April 22 (W): Subsumption.
- April 29 (W): Due: Robot soccer tournament.