SI475:Intelligent Robotics

Course Policy, Spring AY17

Coordinator: Asst. Prof. Gavin Taylor, x3-6816, MI-355, taylor@usna.edu

Course Description: This course presents a survey of the concepts and theories of modern robot systems, including both manipulators and mobile robots. It covers kinematics, sensing, mapping and navigation, decision making, and learning. Concepts are applied on multiple robotic platforms.

Learning Objectives:

1. Understand concepts and theories related to computer-driven robotics systems and computer-based sensor systems;

2. Understand how robotic devices use sensor information to learn about their environment and how they apply AI techniques to this information to plan and accomplish tasks;

3. Apply acquired knowledge in a laboratory environment by designing, coding and debugging robotics control programs using a variety of robotics platforms and sensors (supports Program Outcome (d)).

4. Evaluate the impact on human society that would be made by intelligent robots (supports outcomes (e) and (g)).

5. Present a completed systems to peers (supports outcome (f)).

Student Outcomes:

(d) An ability to function effectively on teams to accomplish a common goal
(e) An understanding of professional, ethical, legal, security, and social issues and responsibilities;
(f) An ability to communicate effectively with a range of audiences
(g) An ability to analyze the local and global impact of computing on individuals, organizations and society

Textbook(s): There are no required texts for this course. There are useful books about - if you feel a text would help you with some concept, please ask, I may have something to loan you.

Extra Instruction: Extra instruction (EI) is strongly encouraged and should be scheduled by email with the instructor after checking his calendar on his web site.

Grading Policy and Collaboration: The guidance in the Honor Concept of the Brigade of Midshipmen and the Computer Science Department Honor Policy must be followed at all times. See `www.usna.edu/CS/resources/honor.php`. Specific instructions for this course:

- Homework: There will be occasional homework assignments. These can be completed collaboratively. In my other classes, part of the purpose of homework is to force students to confront topics they do not understand; there is much less of that in this class. In contrast, this is an elective, for people nearing the end of their major; you know when you do and do not understand concepts, and you will be responsible for taking proper action even without prompting from homework.

- Projects: There will be many projects involving programming a robot. These will be performed in groups of 2 or 3, and will end with an in-class demonstration. You may use any source for help, and discuss them with anybody, but **all submitted work must be your group's**, and all help must be documented.

- Exams: There will be two midterms and a comprehensive final. Should a make-up exam be needed, inform the instructor at least one week in advance.

- Participation: The class is designed as a project-heavy, collaborative experience. Participation is graded so that I can properly reward those who are on board with this. Letting your partner do the work will hurt you both on the exams, and in participation grades.

All collaboration and outside sources should always be cited.

Food/Beverages: None of this, except for drinks with caps. There are robots about. They're expensive and play poorly with crumbs and liquids.

Late Policy: Projects will not be accepted late without a *really* good reason. Homeworks may be submitted one day late, with a 30% subtractive penalty.

Grading: The breakdown of the final course grade will be:

- **25% Final Exam** - the final exam will be cumulative.

- **25% Mid-term Exams** (2) - Mid-terms are written, with no practical component. Bring a calculator, we do math in here.

- **40% Programming Projects** - Detailed instructions for the electronic submission will accompany each project. Much of our classtime will be dedicated to these projects, but they are not intended to be completely finished in class.

- **10% Homework and Participation** - The percentage of this which is homework will be determined based on the amount of homework I feel I have to give. More homework, higher percentage.