Introduction to Perception and Robotics

Georgia Tech CS 3630 Fall 2026 edition

Syllabus

CS 3630 **Introduction to Robotics and Perception** Fall 2026

Course Description

This course covers fundamental problems and leading solutions to autonomous robot navigation – what and how must a robot perceive the world, and how can it use that information to navigate effectively.

Course objectives/learning outcomes

Upon completion of this course, students will be able to:

- Describe and explain what robots are and what they can do
- Describe mathematically the position and orientation of objects and how they move
- Implement navigation and localization algorithms based on sensor fusion and environment representation
- Develop a control architecture for a mobile robotic system
- Write moderately involved programs in Python and Java to control a robotic system
- Construct, program, and test the operation of a robotic system to perform a specified task

Required Course Materials and Prerequisites

No required course materials, but the course requires access to a computer. If you don't have access to a computer, please contact the instructor ASAP. All programming assignments will be completed in Python.

The only formal prerequisite is CS1332 Data Structures & Algorithms. Prior knowledge of fundamentals of linear algebra and probability is helpful, but not required. Background in AI and Machine Learning is not assumed.

Grading Policy and Weighting

The grading distribution is:

Component	Grade
Participation	10%
Quizzes	30%
Projects	60%

- **Participation**: to encourage 100% attendance, we will regularly have pop-quizzes in class, on paper. Your participation in those will constitute 10% of your grade. We will allow you to miss the intro lecture, and up to 1 lecture per module, but your participation grade will be proportional with attendance after that.
- **Quizzes**: Quizzes will have a combination of multiple choice and short essay questions, as appropriate.
- **Projects**: Project deliverables are the most significant component of this course and will make up **60%** of your final grade. The late policy for projects is to linearly decrease the maximum score from 100 to 0, starting at the submission deadline (example: Tuesday, 23:59:59) and ending on (for example) Friday, 23:59:59. Thus, the maximum possible score decreases continuously from 100 to zero over the 72 hour period following the submission deadline.

Attendance policy

Important: Classes are delivered in person.

- **Lectures** will be **in person**. Lectures are not recorded, and attendance is required. Do not sign up for this course unless you can attend the lectures.

Additional criteria for successful completion

Students are expected to interact in small groups in class to discuss the course material and questions related to the material.

Academic honesty / academic integrity statement

Academic dishonesty will not be tolerated. This includes cheating, lying about course matters, plagiarism, or helping others commit a violation of the Honor Code. Plagiarism includes reproducing the words of others without both the use of quotation marks and citation. Students are reminded of the obligations and expectations associated with the Georgia Tech Academic Honor Code and Student Code of Conduct, available here.

You are expected to implement the core components of each project on your own, but the extra credit opportunities often build on third party data sets or code. That's fine. Feel free to include results built on other software, as long as you are clear in your hand-in that it is not your own work.

You should not view or edit anyone else's code. You should not post code to Piazza, except for starter code / helper code that isn't related to the core project.

Statement about acceptable student conduct

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Services offered through the Office of Disability Services

If needed, we will make classroom accommodations for students with documented disabilities. These accommodations must be arranged in advance and in accordance with the ADAPTS office.

Core IMPACTS statement

Not applicable.

Maintained by Frank Dellaert and the TAs of CS 3630

Based on a theme by orderedlist