

CS/ME/ECE/AE/BME 7785
Introduction to Robotics Research
Fall, 2026

Instructor: Sean Wilson, <sean.wilson@gtri.gatech.edu>

Lecture: MWF 12:30pm - 1:20pm
in the Tech Square Research Building (TSRB) 118 and via Zoom,
except on days listed on the schedule

Lab: 24/7 Access in the College of Computing Building (CCB)
Room 049/050

Course Textbook: None

Course Description

This course familiarizes students with several core areas of robotics, including control, perception, AI, and autonomy. Topics are approached primarily from the point of view of autonomous robot navigation - what and how must a robot perceive the world, and how can it use that information to navigate effectively - however, the studied topics are more broadly applicable in other areas of robotics. The class will apply the foundational concepts discussed in the lecture on a Turtlebot3 Burger platform and work through the theory to practice gaps in robotics.

Robots

We will use the Turtlebot 3 robot platform and the Robot Operating System (ROS2). The robots will be made available in a lab space in the College of Computing Building, and you will have access to the space around the clock to come in and test your code. The robots must stay in the College of Computing building; do not take them home.

Assignments and Grading

Labs (65%): There will be 6 lab assignments throughout the semester. Lab grades will be determined using the grading rubric provided with each lab assignment.

Final Lab (15%): The final lab is the culmination of all material learned through the course and the previous labs. The final lab will have its own grading rubric provided with the assignment.

Late Policy for Lab Assignments: All lab assignments are due at the time and date indicated on the assignment document. Each student can use up to 4 late days throughout the semester to extend the due date on lab assignments *excluding the final*. Each late day extends the deadline by 24 hours; one or more late days can be used together. A 20% grade penalty will be applied per day, up to a total of 5 days, for submissions made after all late days have been used up. If you are away for an extended period of time for a research event, conference, or emergency reason, let the instructor know and we can make special arrangements.

Guest Speaker Writeups (20%): The IRIM Seminar Series brings guest speakers across many robotics subfields to Georgia Tech. The seminar takes place in Klaus 1116 or the Marcus Nanotechnology Building, on alternating Wednesdays 12:15-1:15pm. See schedule at <https://research.gatech.edu/robotics/irim-seminar-series>. Exposure to a broad range of robotics topics is a fundamental goal of 7785. Therefore, lectures are canceled on days when the IRIM seminar is held and all students are expected to attend the seminar. If you have a time conflict, please view the video recording. Following the presentation, please submit a reflection on the talk, more details on the content of the writeup will be provided in a separate document. You must submit $n - 2$ writeups for full credit, where n is the total number of presentations. Each writeup should be submitted within 9 days of the speaker's presentation.

Communication with Course Staff and Peers

All assignments and announcements will be posted on the Canvas course website. We will also add everyone to a Slack workspace for more direct communication. If you have a general question, we recommend posting it on Slack in a public channel so that multiple people have a chance to respond and so that others in the class can benefit from the answers. We encourage everyone to actively contribute to discussion, answer each other's questions, and generally use the forums as broadly as possible to make the course run smoothly. If you have a private question, message the course instructors on Slack, Canvas, or by email.

Course Objectives

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

1. Develop a control architecture for a mobile robotic system.
2. Calculate the kinematics of the mobile robot.
3. Implement navigation algorithms based on sensor fusion and environment representation.
4. Construct, program, and test the operation of a robotic system to perform a specified task.
5. Follow the correct experimental design procedures.

Course Policies

The course schedule and policies mentioned in this syllabus may change at any time during the term, but all changes will be clearly documented and announced.

Attendance Policy

Attendance is encouraged but not required for this course. As graduate students, you are expected to make informed decisions about how best to use your time. While lectures will be streamed and recorded whenever possible, occasional technical or unforeseen issues may prevent access to these resources. Although in-person attendance is not mandatory, it is strongly encouraged, as it facilitates real-time interaction, discussion, and engagement with the material.

Student Disability Services

If you need course adaptations or accommodations because of a disability or if you have medical information to share with the instructor, please make an appointment or stop by to speak with Dr. Wilson within the first week of classes.

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail Dr. Wilson as soon as possible in order to set up a time to discuss your learning needs.

Academic Honesty Policy

Review Georgia Tech's [Academic Honor Code](#).

Grading Policy

The course instructors reserve the right to curve the scale dependent on overall class scores at the end of the semester. Any curve will only ever make it easier to obtain a higher letter grade. Grades will fall into the following ranges:

A: 90 – 100

B: 80 – 89

C: 70 – 79

D: 65 – 69

F: 0 – 59