

ECE 6550 – Linear Systems and Controls

Course Syllabus

ECE 6550: Linear Systems and Controls

Credits: 3

Summer 2026

Instructor Information

Instructor: Yorai Wardi

Office: 429 TSRB

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Office Hours:

- Tuesdays, 12:30 pm – 1:30 pm
- Thursdays, 1:30 pm – 2:30 pm

Graduate Teaching Assistant: TBD

TA Office Hours: TBD

Lecture Time: Tuesday and Thursday, 9:30 am – 11:40 am

Lecture Location: Ford Environmental Science & Technology, Room L1116

Course Description

This course covers the fundamental aspects of linear systems and controls, including linear algebra, linear differential equations and controller design. Topics include systems' modes and stability, feedback design, controllability and observability, Kalman decomposition and eigenvalue assignment.

Learning Outcomes

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

1. Analyze linear dynamical systems modelled by ordinary differential equations.
2. Decompose linear, time-invariant systems into their respective modes.
3. Characterize the stability of systems.
4. Understand the concepts of controllability and observability, and use them in feedback design based on Luenberger (state) observers.
5. Perform feedback design for eigenvalue assignment.
6. Design control systems for stability and tracking performance.

Required Course Materials

- **Text:** J. Hespanha, *Linear Systems Theory*, Princeton University Press, Second Edition, 2018. ISBN 9780691179575.

Grading Policy and Weighting

Grades will be determined using the following components:

- Midterm Exam 1 (June 4, 50 minutes): 20%
- Midterm Exam 2 (June 25, 50 minutes): 20%
- Homework Assignments (cumulative): 10%
- Final Exam (TBD): 50%

Final Grade Determination

Final grades will be calculated using two methods:

1. **Absolute scale:**
 - a. 85–100 = A
 - b. 75–84 = B
 - c. 65–74 = C
 - d. etc.
2. **Relative performance scale:**
TBD

The final course - letter grade will be the **higher of the two results**.

Attendance Policy

Attendance is not mandatory; however, regular attendance is strongly recommended. Students are responsible for all material covered in lectures, including announcements, examples, and clarifications.

Additional Criteria for Successful Completion of the Course

To successfully complete the course, students must:

- Complete all exams and homework assignments.
- Submit required work by posted deadlines.
- Demonstrate individual mastery of course content on exams.
- Follow all course policies related to submissions, collaboration, and academic integrity.

Academic Integrity

All exams in this course will be closed-book, closed-notes with no internet access. Students are encouraged to study together and may collaborate in small teams on homework assignments; however, all submitted homework solutions must be written and submitted individually. Exams must be completed independently with no assistance from others.

Violations of academic integrity policies will be handled in accordance with the [Georgia Tech Honor Code \(link\)](#)

Student Conduct (Student-Faculty Expectations Agreement)

Students are expected to maintain a professional and respectful learning environment. The Student-Faculty Expectations Agreement outlines mutual responsibilities and expectations and is available in the Georgia Tech Course Catalog. Respect for others, academic honesty, and constructive participation are essential to the success of the course.

Disability Services Statement

Georgia Tech's policies regarding disability accommodations are administered by the **Office of Disability Services (ODS)**. Students with disabilities or other conditions requiring accommodations are encouraged to contact ODS at <http://disabilityservices.gatech.edu> and to provide the instructor with an accommodations letter as early as possible.