

ECE 486: Control Systems

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Course Information:

Lectures: T/Th 12:20 - 13:50 taught remotely

Prerequisites: ECE 210

Course Description:

This is a first course in feedback control of dynamic systems. A design oriented approach is stressed. Computer based analysis, combined with an accompanying laboratory, provide a realistic setting for mastering several important design methodologies. Concurrent development of basic concepts in lecture and homework provides a foundation for continued study of advanced topics and newly emerging methods. Students come from a wide range of disciplines since control is an interdisciplinary topic.

Course Outline:

- Dynamic models and dynamic response
- Root locus techniques
- Frequency response techniques
- State feedback design

Grading: 5% class participation+20% HW+30% Lab+20% midterm (two take-homes)+25% final (take-home)

Textbook:

Feedback Control of Dynamic Systems by Franklin, Powell, and Emami-Naeini (Edition 8)

Previous editions should, for the most part, be fine, as the material will not be substantially different.

We will closely follow the slides posted on the course website.

Office Hours: These will be on-line via zoom.

Bin: Th 10-11am

Ivan: Tue 16-17pm or by appointment

Xingang: Wed 10-11am or by appointment

Course Logistics: This course will be taught in an on-line format. We will meet via Zoom for synchronous discussions during the regular scheduled lecture time. All lectures will be recorded and posted on Compass. Starting from Lecture 3, flipped classroom will be used. For each lecture, three short 5-minute videos covering related topics will be posted in Compass, and you should watch them before the lectures. The lecture time will be devoted to problem solving and discussions. The problems used in the lectures will be very similar to the problems appearing in the assignments. We are all adjusting to the changes due to COVID-19. Do not hesitate to email me if you have questions, concerns, and/or suggestions for how I might support your learning in this course.

Class participation: You are expected to participate in class activities and discussions actively. More explanations regarding the grade for class participation will be given in Lecture 1.

Homeworks: Homeworks are due at the beginning of the class. Extensions will be granted with instructor approval in advance. Otherwise late homeworks without such prior approval will not be accepted. Besides Assignment 0, there will be 11 assignments in total. The one with the lowest score will be dropped in the final grade calculations.

Midterms: There will be two midterms. Midterm 1 is on 10/07/2021, and Midterm 2 is on 11/16/2021. The regular scheduled lecture time will be used for midterms. Both are take-home exams. More instructions will be sent out later.

Policy on re-grades: Re-grades will be considered if you believe there is an error in the grading of your homework, laboratory, or exam. You should explain the issue in writing and resubmit it to the TAs with a detailed explanation attached. The TAs will re-grade which means you could end up with a higher or lower grade than before.

Accommodations for students with disabilities: If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress.

Academic Integrity: All students are subject to the university's academic integrity policies. A quick reference guide, as well as links to the official student code, can be found at: <https://provost.illinois.edu/policies/policies/academic-integrity/students-quick-reference-guide-to-academic-integrity/>