

## ECE441A/541: Automatic Control

## § Course Details

Instructor	Gregory Ditzler, Ph.D. (Dept. of ECE)
Instructor Email	<a href="mailto:ditzler@email.arizona.edu">ditzler@email.arizona.edu</a>
Lecture Times	8AM-8:50AM
Lecture Room	R. P. Harvill Bldg, Rm 204
Instructor Office Hour	ECE Bldg 356C
	Monday: 9AM-10AM
	Friday: 9AM-10AM
	All other times are by appointment only

## § Description

This course provides an introduction to the fundamental concepts and mathematics of control systems engineering. Through the semester we will cover linear control system representation in time and frequency domains, feedback control system characteristics, performance analysis and stability, and design of control.

## § Textbook

- **(required; all)** *Modern Control Systems*, 12th Edition, R.C. Dorf and R.H. Bishop, Prentice Hall, Upper Saddle River, NJ, 2011.
- **(reference; graduate)** *Feedback Control Theory*, J. Doyle, B. Francis, A. Tannenbaum.  
<http://www.control.utoronto.ca/people/profs/francis/dft.pdf>

## § Software

You will be required to use Matlab<sup>1</sup> to work on assignments throughout the course. Matlab is available for your local computer if you install it with the University of Arizona's site license. Computer in the labs also have Matlab. *We will NOT cover "how to program in Matlab," rather, you are expected to know it or pick it up.*

## § Grading

Your final numerical grade will be computed as follows.

Homework (best seven of eight)	30 points
In class exams (best two of three)	55 points
Final exam	35 points
Project	20 points
Total	140 points

Your course letter grade will be assigned based on your final numerical grade as follows.

90	100	A
80	89	B
70	79	C
60	69	D
0	59	F

At my discretion, I may curve course grades up (but not down). My intent with grading is to reward fair effort with fair credit, in short, I aim to be reasonable. I typically calibrate the assignment of letter grades to final numerical scores by awarding the highest "cluster" of grades of A, the next

<sup>1</sup><http://www.mathworks.com/>

highest “cluster” of grades a B, and then C and lower for the remainder. It is impossible for me to answer the question “what grade will I get” at the week of the withdraw deadline, please do not ask me this.

### § Topics

Week	Topic	Assignment	Date	Chapter
#0	Preparation for Control Systems			Ch1
#1	System Modeling	HW1 Assigned		Ch2
#2	System Modeling			Ch2
#3	System Descriptions and Manipulation	HW1 Due		Ch2/3
	Exam			
		HW2 Assigned		
#4	Feedback System Characteristics			Ch4
#5	Something	HW2 Due		
		HW3 Assigned		
#6	Something			
#7	Exam	HW3 Due		
		HW4 Assigned		
#8	Something			
#9	Something	HW4 Due		
		HW5 Assigned		
#10	Something			
#11	Something	HW5 Due		
		HW6 Assigned		
#12	Exam			
#13	Something	HW6 Due		
		HW7 Assigned		
#14	Something			
#15	Something	HW8 Due		
#16	Something			

### § Academic Integrity

Students are responsible for completing homework assignments by themselves, but may work on strategies to complete the assignments with other students. You are encouraged to work in teams on homework assignments, but copying a completed assignment of another student and submitting it as your own is considered a violation of academic integrity—and it will hurt you when it comes to the exams. Any take-home examinations *may not consist of any group work, even for problem strategies*.

Additional exceptions to this policy will be plainly marked in the requirements for that exercise or project. Any violations of this policy will be dealt with to the full extent permitted by the University of Arizona, and *may result in suspension or expulsion from the university, in addition to a failing grade*. Please familiarize yourself with the Code of Academic Integrity if you have any questions (see <http://deanofstudents.arizona.edu/codeofacademicintegrity>).

### § Student with Disabilities

Most students learn in this course through direct lecture on the board, and through completion of

homework assignments. This year I am also adding limited online videos of worked problems, and derivations that will be skipped in class, in favor of examples to be performed in class.

If you anticipate issues related to the format or requirements of this course, please meet with the instructor to discuss ways to ensure your full participation in the course. If disability-related accommodations are important for your learning in this course, it is very important that you be registered with the Disability Resource Center (621-3268; <http://drc.arizona.edu>) and afterward notify the instructor of your eligibility for reasonable accommodations. Only after that point can we plan how to best coordinate any accommodations.