EE128/ME134 Feedback Control Systems, Fall 2018 (update 8/21/2018)

Instructor: Prof. Ronald Fearing
Office Hours (725 Sutardja Dai Hall) W 1-2, Th 11-12, or email ronf@eecs for appointment.

Teaching Assistants:
Carolyn Chen, OH: Tu 10-11,W 10-11, 125 Cory Hall.
Vatsal Patel, OH : Th 130-230 pm 125 Cory Hall.

Course web page: http://www-inst.eecs.berkeley.edu/~ee128/ for handouts, homework, lecture notes.

Please use Piazza for class questions: https://piazza.com/class/jkuim2hzrg14xf

Text: N.S. Nise, *Control Systems Engineering,* 5th, 6th or 7th edition.
Recommended Software: MATLAB & Simulink Student Version 2010a or later. Check https://software.berkeley.edu/matlab for availability.

Grading: Homework: 15%, Lab 30%, Midterm 20%, Final 35%.

Homework: Homework is due Fri 5 pm in the homework box in first floor Cory. The lowest HW grade will be dropped. Up to 2 people may turn in a single homework writeup with both names listed.

Reader: Nithya Ramgopal, nithya_ramgopal@berkeley.edu

Labs: Scheduled labs will be held in 125 Cory. Due to limited lab stations, groups of 3 (or 4 if needed) students will work together and electronically submit a single Final Lab Report. Prelab is due before lab, with prelabs done individually for the early labs, and jointly for later labs. For the first lab assignments you will be assigned a group within your assigned lab section. You must attend your assigned lab section. By arrangement only with GSIs, 2 students can request to swap sections with each other.

Section 101: M 2-5 pm,
Section 102: Tu 2-5 pm,
Section 103: W 11 am -2 pm,
Section 104: W 2-5 pm,
There are no discussion sections.

Honest and ethical conduct. All work submitted to the class must be your own or attributed. The penalty for unethical conduct on exams will a grade of F or NP and a letter will be written to the campus Office of Student Conduct. The penalty for unethical conduct on homework or labs will be a -100% grade on that assignment.

EE128/ME134 Course Schedule (draft 8/21/2018)
[please see class web page for updates]

Wk	Lec	Date	Lecture	Reading	HW	LAB
1	1	Thu 8/23	Overview, intro. to FB control, dynamic models slides	Ch. 1.	HW1 due 8/31	no lab
2	2	Tue 8/28	Modeling in the frequency domain slides	Ch. 2.	HW2 due 9/7	no lab
2	3	Thu 8/30	Modeling in the time domain slides	Ch. 3.		no lab
3	4	Tue 9/4	Modeling in the time domain	App. G.	HW3 due 9/14	Lab 1: Modeling Simulation in MATLAB / Simulink
3	5	Thu 9/6	Time response slides	Ch. 4		Lab 1
4	6	Tue 9/11	Time response	App. J.	HW4 due 9/21	Lab 2: Basic concepts in control system design
4	7	Thu 9/13	Stability slides	Ch. 6		Lab 2
5	8	Tue 9/18	Steady state errors slides	Ch. 7	HW5 due 9/28	no lab
5	9	Thu 9/20	Steady state errors			no lab
6	10	Tue 9/25	Root locus techniques slides , AppM , Rule List	Ch. 8	HW6 due 10/5	Lab 3: Quanser hardware & proportional control
6	11	Thu 9/27	Design via root locus slides	Ch. 9		Lab 3
7	12	Tue 10/2	Root Locus. Frequency response techniques slides	Ch. 10	HW 7 due 10/12	Lab 4: Model-based position control of a cart
7	13	Thu 10/4	Frequency response techniques			Lab 4
8	14	Tue 10/9	Frequency response techniques			Lab 5a Magnetic levitation
8	15	Thu 10/11	Design via frequency response slides	Ch. 11		Lab 5a
9	16	Tue 10/16	midterm review		HW8 due 10/26	no lab
9	17	Thu 10/18	Midterm: HW1-7, lec 1-13, Ch 1-10, lab 1-4 **room TBA**			no lab
10	18	Tue 10/23	Design via frequency response ex11.2 ex11.3		HW9 due 11/2	Lab 5b: Magnetic levitation
10	19	Thu 10/25	Design via state space slides controllability (v3) notes	Ch. 12 Ch. 5.7, 5.8		Lab 5b:
11	20	Tue 10/30	Design via state space		HW10 due 11/9	Lab 6a:Pole placement for the inverted pendulum
11	21	Thu 11/1	Design via state space (Observer)			Lab 6a:
12	22	Tue 11/6	Design via state space (integral control, separability)		HW 11 due 11/16	Lab 6b: Luenberger observer design for inverted pendulum
12	23	Thu 11/8	LQR Design LQR notes			Lab 6b:
13	24	Tue 11/13	Digital control slides DT notes	Ch. 13	HW 12 due 11/30	Lab 6c: LQR controller design for inverted pendulum
13	25	Thu 11/15	Digital control systems slides	Ch. 13		Lab 6c:
14	26	Tue 11/20	Digital control systems slides			no lab
		Thu 11/22	Thanksgiving Holiday			no lab
15	27	Tue 11/27	control with vision systems. Dynamic effects in visual closed-loop systems , slides from Prof. Jagersand	Corke&Good TRA 1996		Lab 6d: Self-erecting inverted pendulum
15	28	Thu 11/29	Course wrap up and review Fall 2011 Final and (sol)			Lab 6d
16		Tue 12/4	**RRR Week**, No Lecture			no lab
16		Thu 12/6	**RRR Week**, No Lecture			
17		Thu 12/13	**Final Exam is tentatively Thursday 12/13 1130 am**			