EE128/ME134 Feedback Control Systems, Spring 2017 (update 1/18/2017)

Instructor: Prof. Ronald Fearing
Office Hours (725 Sutardja Dai Hall) W 2-3, Th 2-3, or email ronf@eecs for appointment.

Teaching Assistants:
Eric Choi, yk90@berkeley.edu, OH: M1-2 pm,Wed 3-4 pm, 125 Cory Hall.
Tianshi Wang, tianshi@berkeley.edu, OH: Tu 1-2, Th 3-4 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/id65ivtpk62lz

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: Nicholas Sunjaya

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, E. Choi
Section 103: Tu 2-5 pm, T. Wang
Section 102: W 11-2 pm, E. Choi
Section 104: Th 11-2 pm, T. Wang
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 1/13/2017)
[please see class web page for updates]

Lec #	Date	Lecture	Reading	PS	Lab
1	Tues 1/17	Overview,intro. to FB control, dynamic models slides	Ch.1.	HW1 due 1/27	no lab
2	Thu 1/19	Modeling in the frequency domain slides	Ch. 2.		no lab
3	Tues 1/24	Modeling in the time domain slides	Ch. 3.	HW 2 due 2/3	no lab
4	Thu 1/26	Modeling in the time domain	App. G.		no lab
5	Tue 1/31	Time response slides	Ch. 4	HW3 due 2/10	Lab 1: Modeling Simulation in MATLAB / Simulink
6	Thu 2/2	Time response	App. J.		Lab 1
7	Tue 2/7	Stability slides	Ch. 6	HW4 due 2/17	Lab 2: Basic concepts in control system design
8	Thu 2/9	Steady state errors slides	Ch. 7		Lab 2
9	Tue 2/14	Steady state errors		HW5 due 2/24	no lab
10	Thu 2/16	Root locus techniques slides , AppM , Rule List	Ch. 8		no lab
11	Tues 2/21	Design via root locus slides	Ch. 9	HW6 due 3/3	Lab 3 Quanser Hardware and proportional control
12	Thu 2/23	Frequency response techniques slides	Ch. 10		lab 3
13	Tue 2/28	Frequency response techniques		HW 7 due 3/17	Lab 4: Model-based position control of a cart
14	Thu 3/2	Frequency response techniques			Lab 4
15	Tue 3/7	midterm review			no lab
16	Thu 3/9	Tentative Midterm : HW1-6, lec 1-14, Ch 1-10, lab 1-4			no lab
17	Tue 3/14	Design via frequency response slides	Ch. 11	HW8 due 3/24	Lab 5a Magnetic levitation
18	Thu 3/16	Design via frequency response			Lab 5a
19	Tue 3/21	Design via state space slides controllability (v3) notes	Ch. 12 Ch. 5.7, 5.8	HW9 due 4/7	Lab 5b: Magnetic levitation
20	Thu 3/23	Design via state space			Lab 5b:
	3/27-3/31	SPRING BREAK			no lab
21	Tue 4/4	Design via state space (Observer)		HW10 due 4/14	Lab 6a:Pole placement for the inverted pendulum
22	Thu 4/6	Design via state space (integral control, separability)			Lab 6a:
23	Tue 4/11	LQR Design LQR notes		HW 11 due 4/21	Lab 6b: Luenberger observer design for inverted pendulum
24	Thu 4/13	Digital control slides DT notes	Ch. 13		Lab 6b:
25	Tue 4/18	Digital control systems slides	Ch. 13	HW 12 due 4/28	Lab 6c: LQR controller design for inverted pendulum
26	Thu 4/20	Digital control systems slides			Lab 6c
27	Tue 4/25	control with vision systems. Dynamic effects in visual closed-loop systems.	Corke&Good TRA 1996		Lab 6d: Self-erecting inverted pendulum
28	Thu 4/27	Course wrap up and review Fall 2011 Final and (sol)			Lab 6d
	Tue 5/2	**RRR Week**, No Lecture			no lab
	Thu 5/4	**RRR Week**, No Lecture			
	Thu 5/11	**Final Exam is Thu 5/11 7-10 pm** Sp15 sol			