Tentative* Syllabus

* Some details (e.g., lab times and lecture topics) are subject to change in Week 1.

Instructors:

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Lecture: Tue, Thur 3:30-4:45pm Girvetz 2127
Lab Group 1: Wed 7-9:50pm   Harold Frank Hall 3120
Lab Group 2: Fri 1-3:50pm   Harold Frank Hall 3120

Website: http://www.ece.ucsb.edu/courses/ECE147/147B_W11Byl/index.html

Required Text:
(FPW) Franklin, Powell, and Workman, "Digital Control of Dynamic Systems, 3rd edition". *See website for information on purchasing a reprint of the book.*

Grading: Homework (25%), Lab (25%), Mid-Term (20%),   Final (30%).

- **Homework and Computer Modules:** There will be 4 homework assignments and 4 computer module assignments. These will be scheduled such that you will never have both a homework and module due in the same week. Only the best 7 out of 8 of these assignments will count toward your term grade.

- **Laboratories:** Each pre-registered student should currently be assigned to one of two lab groups. **For week 1,** Group 1 meets Wed, 7-9:50pm. Group 2 meets Fri, 1-3:50pm. The permanent meeting schedule may be modified for all future weeks (but only if required by significant student scheduling conflicts). You must contact the instructors if you need to switch lab groups. Lab begins the first week of class with an introductory mini-session ("Lab 0") for which no write-up is due. See the link to the lab website for more information on pre-lab assignments and post-lab reports.

- **Mid-Term Exam:** The mid-term is (*tentatively!*) scheduled for Tuesday, February 8 during lecture (3:30-4:45pm in Girvetz 2127) and will cover material (in lecture and/or lab) from the first 5 weeks of class (i.e., through February 6). You are allowed one (1) single-sided 8½ x 11 sheet of notes for the mid-term exam. Your "cheat sheet" must be self-prepared and will also be submitted with your exam; it will then be returned (unmarked) along with your graded exam.

- **Final Exam:** A 3-hour final exam will cover class material (in lecture and/or lab) from all 10 weeks of class. Time (Friday, March 18, 4-7pm) and location (TBA) are determined by the registrar. You are allowed two (2) single-sided 8½ x 11 self-prepared sheets of notes for the final exam. Both of these "cheat sheets" will also be submitted with your exam; they will then be returned (unmarked) along with your graded exam.

Tentative Lecture Schedule

The ordering below attempts to address topics most relevant for upcoming lab and module assignments in a timely manner. This schedule may be revised somewhat throughout the term.

Week	Topics	Reading
1	Review of CT dynamics and control. Freq. response (Bode). Lag, lead, phase margin, crossover. Z-domain vs S-domain.	FPW Ch. 1,2,3
2	Discrete System Analysis. "Deadbeat" control.	FPW Ch. 4 (starred sections optional)
3	Discrete Equivalents.	FPW Ch. 6
4	Sampled-Data Systems.	FPW Ch. 5 (O&W* Ch. 7 optional)
5	Discrete equivalent controllers / Review for midterm.	FPW (7.1), 7.2
6	Midterm (FPW CH. 4-7.2) / Intro to pole placement.	FPW 8.1
7	Estimator design via pole placement. Separation principle.	FPW 8.2, 8.3
8	Frequency response methods.	FPW 7.4
9	Integral control via state augmentation. Intro to LQR	FPW 8.5.1, 9.3.5, 9.4.1
10	Quantization. Review.	FPW 10.1

*Supplemental Text: Another good reference on "Sampling" is Chapter 7 of "Signals and Systems," by Oppenheim and Willsky, abbreviated O&W in the Reading list above. This material is entirely optional, but may be worth reviewing, if you already own the book.

Due dates. The schedule below is a general guideline. There may be exceptions for particular due dates, and the entire schedule may be revised during Week 1, to accommodate changes (if any) in lab schedule.

- **Homework:** Due by **THURSDAY at 3:30pm**. Can be submitted in class or any time BEFORE class in the drop box. (No HW is due Week 1 or Week 6 (midterm week).)

- **Pre-lab:** Due on **MONDAY at noon**, in the drop box outside HFH 3120. There are 7 required pre-labs (no pre-lab for weeks 1, 6, or 10.), and 1 extra credit pre-lab.

- **Lab reports:** Due in Lab, **the next time your group meets after a lab is performed**. (Usually, this means one week later, except for midterm week.)

Calendar. See the "Calendar" hand-out for a more details table of important dates.