

Course Syllabus

- Description** This is a project-based course in digital control. We will cover a variety of topics relevant and typical to real-world control implementations: sampling, filters, digital control design, and a variety of non-linear dynamic effects (saturation, slew rates, friction, backlash, etc.). Typical projects include inverted pendulum swing up and stabilization, pendubot control, a chaotic bouncing ball, a maglev device, and a balancing seesaw. Additional student-designed options are certainly possible (and encouraged!), but you must demonstrate working hardware by the mid-term review to continue work on any project using equipment that is not already in the Control Lab (HFH 3120A).
- Instructor** Prof. Katie Byl (katiebyl@ece.ucsb.edu)
Room 5115, Harold Frank Hall
- Lecture** Monday and Wednesday, noon-1:50pm, in HFH 3120A (Controls Lab).
- Lab** Open hours, by card access, in HFH 3120A. Please stop by the ECE Electronics Shop (HFH 1160) to let them know you will need access to 3120A for ECE 238. If you do not already have an access card, you will need to purchase one, as well.
- Prerequisites** A good graduate course in *Controls*.
- Office Hours** Wednesday 2-4pm (and/or by appointment), in 5115 HFH.
- Optional Text** There is no required text for this course. If you want a reference, I suggest “Digital Control of Dynamic Systems” by Franklin, Powell and Workman (FPW) [3rd ed., Addison Wesley Longman, Inc., 1998].
- Grading** The goal of this course is to get hands-on experience at “making things work” via digital control, and this will require completion of a term project of your choice. The homework assignments should be helpful toward this goal, but are of secondary importance. Your grade will be the higher of the following two options:
20% Homework 80% Final Project
50% Homework 50% Final Project
(Toward encouraging completion of the homework, I will note that grading on homework will likely be more lenient.)
- Homework** Homework will consist of a combination of on-paper problems and in-lab assignments. Homework can be turned in either electronically (email to katiebyl@ece.ucsb.edu) or in the homework drop box outside of HFH 3120A.
- Final Project** Includes a mid-term project update, and an end-of-term presentation (10 minutes) and final report (5pp). More details will be given in class.