UCSB “Linear Systems I”
ME243A/ECE230A, Fall 2013
Instructor: Francesco Bullo

This is the website for the UCSB course ME 243A / ECE 230A “Linear Systems I”, Fall 2013 (lecture times during period: Mon.30sep2013 through Wed.04dec2013). This information is available at the URL http://motion.me.ucsb.edu/ME243A-Fall2013.

Description

The purpose of this course is to provide the students with the basic tools of modern linear systems theory: stability, controllability, observability, realization theory, state feedback, state estimation, separation theorem, etc. For time-invariant systems both state-space and polynomial methods are studied. The students will also be introduced to the computational tools for linear systems theory available in MATLAB. The intended audience for this course includes, but is not restricted to, students in circuits, communications, control, signal processing, physics, and mechanical and chemical engineering.

Lecture Time and Place

Engineering Bldg II, Room 2243, Mon and Wed 10:00am-11:50am

Course credit

Units: 4

Prerequisites

ME / ECE 210A Matrix Analysis and Computation
Graduate-level matrix theory with introduction to matrix computations. SVD’s, pseudo-inverses, variational characterization of eigenvalues, perturbation theory, direct and iterative methods for matrix computations.

Textbook

The course will follow closely:
All students are strongly encouraged to review linear algebra. Chapter 3 of C-T Chen’s book provides a brief summary but a review of a Linear Algebra textbook (such as the text below) is preferable, especially if one goes through a few exercises.
**Instructor**
Professor Francesco Bullo
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**Office hours**
Please email or phone me in advance to schedule for an appointment. Preferred times are Mon 1:30pm-3pm.
If you have any questions about the course, please send me email. I will try to respond as quickly as possible. Additionally, I will share questions that are particularly good (and their answers) with the rest of the class by broadcasting my answer to the entire class.
If you plan to come to office hours for questions about homework, please be prepared to show attempts at solving the problem that you prepared before coming.

**Grading**
- Your grade will be assigned roughly according to the following percentages.
  1. Homework 30%
  2. Midterm 30%
  3. Final 40% (Monday December 9, 8-11am, Engr Bldg II, room 2243)
- In exceptional cases, I reserve the right to give extra points for excellent performance on the final. Please, do not count on it as a way to avoid doing homework assignments.
- Partial credit will be given only if answers are not accompanied by satisfactory explanations (e.g., clearly organized answer, all intermediate steps, clearly readable handwriting).
- Exams and quizzes will be closed book and closed notes. You may prepare an exam aid (cheat sheet) in your own handwriting, consisting of one, one-sided sheet (letter size, 8.5x11in) for the midterm and one, two-sided sheet for the final exam. No calculators/tablets/cellphones are allowed during the exams (they would be useless anyway).
- Homework will be typically assigned on Wednesday and will be due the following Wednesday, 7 days later, e.g., Homework for Week 1 is due on the Wednesday of Week 2.
- Self-grading scheme: On the day the homework is due, (1) you will confirm that you completed the homework, (2) I will provide you with the answer key. Over the next few days, (4) you will self-grade your homework, and (4) you will turn in your self-graded homework by the following lecture on Monday. You will not have access anymore to your solutions after turning them in.

**Computer Access & Matlab**
I expect all of you to be familiar with the College of Engineering computer laboratories. Some of the homework and all computer laboratory assignments will require working knowledge of Matlab.
A matlab primer is available in the handout section of the course website.

**Collaboration Policy**
[Collaboration Policy for this course](Academic Dishonesty @ Wikipedia)