Course Information

One of the key abilities of an engineer is system-level thinking. Taking EE 120 will help you develop this skill. In particular, you will see how the math and physics you have learned in other courses help you understand rather complex systems that occur in engineering and computer science (with applications to communication systems, biomedical imaging, control, and robotics), but also in other disciplines such as neuroscience. The knowledge and skills that you will acquire in EE 120 are at the heart of an entire series of senior-level and graduate classes, including 121, 123, 125, 128, 192, 221A, 224, and 226A. EE 126 (Probability and Random Processes) is not required for this course and gives a complementary set of tools needed for advanced material, especially in the areas of communications and signal processing. We assume that you have familiarity with lower division physics and circuits since these are the source of many examples.

1 Logistics

Instructor Kannan Ramchandran, 269 Cory, kannanr@eecs.berkeley.edu
OH: Tue 1:30-3 in 400 Cory
Assistant: Amy Ng, 253 Cory, amy@eecs.berkeley.edu

GSI Mark Johnson, OH: Mon 2-3 in 197 Cory, markgsi@gmail.com
June Wang, OH: Wed 12-1 in 197 Cory, junegsi@gmail.com
Omar Bakr, OH: Thu 9-10 in 197 Cory, omar.eecs@gmail.com

Lecture Tuesdays and Thursdays, 10-12, 277 Cory

Grading HW (15%)
Two quizzes (5%)
Midterm, October 19 (evening) (30%)
Final Exam (50%)
Exams are closed-book and closed-notes; calculators, computing and communication devices are not permitted. (Handwritten, non-photocopied cheat sheets will be allowed; detailed specification will be given in class.)

Prerequisites EE 20, Math 53 and 54 (absolute must - contact me if in doubt)

E. A. Lee and P. Varaiya. Structure and Interpretation of Signals and Systems. Addison-Wesley, 2003. (This is the EECS 20 textbook.)

Sections Section 101: Mondays 12-1, 293 Cory Hall (M. J.)
Section 102: Wednesdays, 9-10, 521 Cory Hall (J. W.)
Section 103: Fri, 10-11, 521 Cory Hall (O. B.)
Note: You may attend any of the sections.

Website http://inst.eecs.berkeley.edu/~ee120/
Newsgroup ucb.class.ee120

2 Course Outline

• Signals and Systems: Basic Properties
• LTI Systems in the time domain, convolution
• Fourier Representations
• Sampling
• Signal Processing. Filter design, aliasing, windowing, interpolation, FFT.

3 Homework Policy

• General: Homework will be posted online every Thursday and will be due the following Thursday at 5 PM. Solutions will be posted on the course webpage in the evening of the due date. Therefore no late homework will be accepted. Please make a photocopy of your homework (including code for MATLAB problems) and hand in one copy to the designated mailbox (EE 120 mailbox in the student lounge on the second floor of Cory Hall). Please staple your homework and mark on the first page how many pages total are submitted. Graders will pick up your homework at 5 PM. One lowest homework score will be dropped.

• Collaboration: Discussions about homework are allowed and encouraged but each student is expected to write his/her own solutions.

• Self-Grading and Score Submission: Students will grade their own homework and submit the score to the TA no later than 10 PM on the following Monday. Graders will grade the copy of the homework that was placed in the mailbox. Your scores and the graders’ scores will be cross-checked. If there are inconsistencies, the instructor will be notified, and will take actions accordingly. Please note the department policy on academic dishonesty: http://www.eecs.berkeley.edu/Policies/acad.dis.shtml
You can get 3 possible scores for a problem, 0, 0.5 and 1. If your solution is entirely correct, you get 1 point. If your solution is more than 50% correct on a single-part problem or you solve at least half the parts entirely correctly for a multi-part problem, you get 0.5 point. Otherwise you get 0 for the problem.

In the email to the TA to report the score, the title should be of the following format: EE120HomeworkX (where X is the homework assignment number). The content of the email should include name, student ID number, and a row of scores (the number of scores should be equal to the number of problems). Please only put spaces between the scores for each problem, i.e. no commas, no semi-colons, no new-lines.

Example of a student submitting self-graded score for Homework 1, in which there are 6 problems.

Title of email: EE120Homework1
Content of email:
Name: First Last
SID: 10001000
1 0.5 1 0 1 1

4 Matlab / Instructional Account Information

About 25% of the homework will involve numerical exercises using MATLAB. Please turn in any graphs you are asked to plot, along with listings of your MATLAB scripts. It is strongly recommended that you not do the MATLAB exercises at the last minute, so that you will not be at the mercy of circumstances beyond your control, e.g., a printer breakdown.

The assigned exercises can be done on any computer running MATLAB 6. No multimedia capability is required. Three options are available for running MATLAB:

1. Run MATLAB on the EECS instructional Unix system. You can log in to the Unix systems using the terminals in 199 Cory. Alternatively, you can access these Unix systems from any computer at home or on campus using ssh over the Internet. About two thirds of the students in the class already have “named” accounts. Students who do not have accounts can request them by logging in as username newacct, password newacct, in 199 Cory, or over the Internet via ssh to cory.eecs.berkeley.edu. Your “named” account will not expire at the end of the semester. For more information, refer to the EECS instructional systems website at: http://inst.eecs.berkeley.edu/connecting.html

2. Run MATLAB on the EECS instructional Windows systems. You can log in to the Windows systems using the same “named” account as for the Unix systems. You can use any of the Windows systems listed at: http://inst.eecs.berkeley.edu/~inst/iesglabs.html

3. Buy the student version of MATLAB 6, along with the Control and Signal Processing Toolboxes.