Course Information

One of the key abilities of an engineer is system-level thinking. Taking EECS 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 EECS 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. EECS 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 Michael Gastpar, 265 Cory, gastpar@eecs.berkeley.edu
OH: Mondays 11-12 and Tuesdays 10:30-11:30 in 258 Cory
Assistant: Chris Colbert, 275 Cory, x2-8458.

GSI Mark Johnson, OH: Wednesdays 1-2 in 197 Cory, markgsi@gmail.com
Wei Wang, OH: Thursdays 5-6 in 197 Cory, weigsi@gmail.com

Lecture Mondays and Wednesdays, 2-4, 4 Leconte Hall

Grading HW (20%)
Exam 1, October 5, 2005 (in class) (20%)
Exam 2, November 9, 2005, 7-9PM (20%)
Final Exam (40%)
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 EECS 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.)

Homework Typically assigned on Mondays, due on Thursday 10 days later
Each student must turn in a set of solutions. No copying is permitted.
The homework problems will be graded on a scale of 0, 1, and 2. A 2 indicates a good
effort and understanding, a 1 indicates a reasonable attempt on the problem, but with significant gaps in understanding or completion, and a 0 indicates very little effort or understanding. Learning the material on the homework is important to do well in the class – if you miss a problem, study the solutions.

Sections
Section 101: Mondays 12-1, 293 Cory Hall (M. J.)
Section 102: Wednesdays, 9-10, 293 Cory Hall (M. J.)
Section 103: Thursdays, 4-5, 293 Cory Hall (W. W.)
Section 104: Fridays, 10-11, 293 Cory Hall (W. W.)
Note: You may attend any of the sections.

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

2 Course Outline

1. Signals and Systems: Basic Properties (1 lecture)
2. LTI Systems in the time domain, convolution (2 lectures)
3. Fourier Representations (4 lectures)
4. Sampling (4-5 lectures)
7. Signal Processing. Filter design, aliasing, windowing, interpolation, FFT. (6 lectures)

3 Matlab

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 Unix accounts. Students who do not have Unix accounts can request them by logging in as username newacct, password newacct, in 199 Cory, or over the Internet via ssh to
Your Unix account will not expire at the end of the semester. For 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. By the end of the first week of classes, the EECS Instructional and Electronics Support Group will set up Windows accounts for all students in the class (including those on the waiting list). A list of user names will be posted at the class news group, ucb.class.ee120. The initial password will be your student identification number. Your Windows account will expire at the end of the semester. 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.

4 Related Books of Interest

If you do not like our textbook, you may want to take a look at the textbook by Haykin (“Signals and Systems”). However, there is absolutely no need to look at that book in order to do well in the class.


  In my view, a very nice handbook to have around. Very well organized!