1 Course Goals and Outline

This is one of the key courses, teaching you how the mathematics you have learned earlier is actually useful to understand signals and systems. The course will build on EECS 20 and will help give you the tools and understanding you will need to get to senior/grad level classes like 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.

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

2 Matlab

Some of the homework will involve numerical exercises using matlab. Please turn in any graphs you are asked to plot, along with listing 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 optional supplementary text Mastering Matlab 6 is a good tutorial and reference on Matlab, and you will find it especially useful if you have never used matlab before. If you have used matlab previously, you probably do not need to buy this book. You can find out about any specialized matlab functions you might need by using matlab’s built-in help function.

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 cory.eecs.berkeley.edu. Your Unix account will not expire at the end of the semester. For information, refer to 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/~iesg/iesglabs.html.

3. Buy the student version of Matlab 6 or Matlab 7, along with the Control and Signal Processing Toolboxes.
Instructor  
Venkat Anantharam, 254M Cory, ananth@eecs.berkeley.edu  
OH Tu 1-2, Tu 4-5

GSI  
Rahul Tandra, OH TBA, tandra@eecs.berkeley.edu  
Ben Wild, OH TBA, ben.wild@algochip.com

Lecture  
Mondays and Wednesdays 2-4 PM, 277 Cory Hall

Grading  
Homework score H (max 100) will be based on the best 10 of 12 Hwks.  
Two Midterms will generate a midterm score  
\[ M = 0.65 \text{ (higher) } + 0.35 \text{ (lower)}. \]  
Max of M is 100.  
Final Exam will generate score F (max 100).  
Overall score 0.2 H + 0.48 (higher of F and M) + 0.32 (lower of F and M)  
will be used to determine the grade.

Prerequisites  
EECS 20 (absolute must) and Math 53 and 54.

Required Texts  
E. A. Lee and P. Varaiya, *Structure and Interpretation of Signals and Systems*.  
Addison-Wesley, 2003. (this is the EECS 20 textbook.)  
A. V. Oppenheim and A. V. Willsky with S. Nawab, *Signals and Systems*.  

Homework  
Homework will be assigned typically on Thursday and will be due  
ten days later on Monday. See the detailed schedule.  
*Late homework will not be accepted.*  
Discussing the homework problems with other students is okay, but  
each of you is expected to independently write out his or her own solutions.

Section  
Section 101: M 12:00 -1:00P, 293 Cory  
Section 102: W 9:00 - 10:00A, 293 Cory  
Section 103: Th 4:00 - 5:00P, 293 Cory  
Section 104: F 10:00 - 11:00A, 293 Cory

Website  
http://inst.eecs.berkeley.edu/~ee120

Newsgroup  
ucb.class.ee120

Additional  
Reference  