

EE 701 – Linear System I

Spring Quarter, 2008

4.0 Credit Hours

Course Website: <http://www.cs.wright.edu/~ashaw /ee701>

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OFFICE HRS.: 2:00-3 PM (TUE/THU) and *by appointment*

Textbook: — B. P. Lathi, Signal Processing and Linear Systems, Oxford University Press, 1998.

Recommended Software

- *Student Version of Matlab 7.4 and Simulink 6.6*; The Mathworks, Boston, MA, 2007. **Note:** The Student edition is a low-cost stand-alone version of the full-feature Matlab package. It is packed with seven most commonly used Toolboxes and Blocksets (Signal Processing, Image Processing, Statistics, etc.) useful for all engineers. The student version can be purchased at www.academicsuperstore.com.

Prerequisites: — EE 321/521 or any Undergraduate level Linear Systems course (with a grade of “D” or better)

Topics: — Linear System I provides students an introductory, yet comprehensive, treatment of continuous-time systems and signals that commonly appear in Electro-mechanical, Control Systems, Communication Systems, and various other disciplines. The primary topics covered in the course are the following,

- Basics of signal and system models and representations - both in time and frequency domains (**Chapter 1**)
- Response of Linear systems - both Mechanical and Electrical, when the input is an Impulse, Step or a sinusoid signal (**Chapter 2**)
- Analysis of Zero-input, zero-state and Total responses in the time domain. (**Chapter 2**)
- Three classical frequency domain representations:
 - ★ Laplace Transform: (**Chapter 6**)
 - ★ Fourier Transform: (**Chapter 4**)
 - ★ Fourier Series: (**Chapter 3**)
- Solution of Differential Equations in
 - ★ Time domain (Classical approach) (**Chapter 2**)
 - ★ Frequency domain (algebraic approach using Laplace Transform, which is simpler than the classical approach) (**Chapter 6**)
- Analysis of systems using Transfer Function and Frequency Response (**Chapter 6, Chapter 7**)
- Convolution of Continuous-time systems (**Chapter 2**)
- Discrete-time signals and systems (**Chapter 8**)
- Time-domain and Frequency domain Analysis of Discrete time systems (**Chapter 9**)
- Z-Transform and Discrete-Time Fourier Analysis (**Chapter 10, 11**)

Grading policy:

Mid-term : (May 6, 2008,)	35%
Final Exam (Comprehensive): (June 10, 2008, 5:45-7:45 PM)	40%
In-Class 10-minute Quizzes (lowest Marks dropped)	10 %
Home work and Computer projects :	15%

NOTE: If the total score is less than 50%, the final grade will be *F!!*

Other Information

- (a) No make-up examination will be given unless the student has received permission from the instructor prior to the examination or has experienced some emergency beyond control!!
- (b) Students are permitted to use a self-prepared study guide (Formulas, Tables etc.) during the exams. Please do not bring in solved problems, steps or procedures to solve exam problems.
- (c) Homework and Computer Projects will be assigned and graded regularly and the solutions will be posted in the EE Department on the due date. Hence, late submissions will not be graded (unless prior permission is obtained from the Instructor).
- (d) Students are expected to work out all the assignments independently and turn in his/her works on due dates noted in the Syllabus.
- (e) Each student will get a computer account on the GAMMA machine to perform the computer experiments.
- (f) The students are expected to make use of the posted office hours to have their academic difficulties resolved. Students are also welcome at other times. However, please call beforehand to make sure the Instructor is available.