EE 642/CPE 641
Data and Digital Communications
Spring 2010
Tuesday and Thursday, 2:20-3:40, EB 240
Instructor: Laurie L. Joiner 217B Engineering Building 824-6126
Office Hours: TTh 10:00-11:00; W 2:00-3:00 email: ljoiner@ece.uah.edu

Textbook:

Pursley, M., *Introduction to Digital Communications*, Prentice-Hall, 2005.

References:

Sklar, B., *Digital Communications Fundamentals and Applications*, Prentice-Hall 2000.

Proakis, J. G. *Digital Communications*, McGraw-Hill, 1995.

Objectives:

- Analyze second-order random processes in linear systems
- Optimize decision rules based on different criteria, such as the minimax and Bayes' rules
- Design the "optimum" receiver for a baseband signal set transmitted on an additive white Gaussian noise (AWGN) channel
- Determine the error probabilities for communications over an AWGN channel
- List error probabilities for commonly used communication schemes, including coherent demodulation of BPSK and QPSK and noncoherent demodulation of FSK and DBPSK
- Use signal space concepts to determine the error probabilities for more complicated modulation schemes
- Sketch the "optimal" demodulators for common modulation schemes with coherent or noncoherent demodulation
- Explain the terms fading, nonselective, frequency-selective, time-selective
- Explain the relative performance of systems in fading and non-fading channels
- Use the Rayleigh density function to calculate error probabilities for communication over nonselective Rayleigh fading channels

Grades will be based on:

Homework and projects: 20%
Two in class exams: 40%
Final exam: 40%

A final average of >90% will be guaranteed an A, a final average of >80% will be guaranteed at least a B, a final average of >70% will be guaranteed at least a C, etc.

The final exam will be on Tuesday, May 4 from 3:00-5:30 PM.

Homework is due at the beginning of class. No credit will be given once solutions have been made available.

Students are responsible for material covered in class. Make-up exams must be scheduled at least 48 hours before an exam if possible. Make-up exams are generally more difficult.

The academic honesty policy is fully described in the student handbook, and students are fully expected to adhere to it. Discussing homework is permitted, but the work submitted must be your own. Copying another person's work and turning it in as your own is not acceptable. Penalties for cheating range from a 0 on the assignment to an F for the course grade, and will be administered according to the student handbook.

Class notes, homework assignments and homework solutions are located on the web at http://www.ece.uah.edu/~ljoiner/ee642
Please email me if there are problems with the web site.