Communication and Information Theory

ECE 460

Spring 2008

Instructor Dr. B.-Peter Paris
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Time and Place Tuesday and Thursday, 12:00pm-1:15pm, Robinson Hall, room B228.

Office Hours Tuesday 5:30-6:30pm and Thursday 10:30-11:30am or by appointment.

Required Textbook 1. J.G. Proakis and M. Salehi, *Communication Systems Engineering*, Second Edition, Prentice Hall, Englewood Cliffs, NJ, 2002.

Recommended Further Reading

1. J.G. Proakis and M. Salehi, *Contemporary Communication Systems using MATLAB*, Brooks/Cole, 2000.
2. R.E.Ziemer and W.H.Tranter, *Principles of Communications*, Fourth Edition, Houghton Mifflin, Boston, MA, 1995.
3. MATLAB Student Edition, The Mathworks, Inc.

Homework will be assigned every week and is due the following week.

You are encouraged to work on the assignments in small groups. Do not refer to homework solutions distributed in previous semesters; copying from old solutions constitutes plagiarism and will be handled in accordance with the Honor Code. Homework solutions will be made available. Homework will be collected and graded by the teaching assistant.

Exams A Midterm and a Final Exam will be given during the semester. Make-up exams are rarely given. In case of an emergency, contact the instructor as soon as possible and always *before* the exam. Failure to take an exam, will result in no credit for the exam.

All exams are conducted under the rules and regulations of the **Honor Code** (see University Catalog).

Teaching Assistant Anish Mitra
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On-line Class Material Class material will be distributed electronically via the World-Wide Web. Use a browser to find the ECE 460 homepage at URL:
`http://www.spec.gmu.edu/~pparis/classes/ece460.html`.

Final Grades are determined by a weighted average of homework, the two exams, and the final exam in the following manner:

Homework	20%
Exam 1	30%
Final	50%

Tentative Course Schedule

Part I: Signals & System and Analog Signal Transmission and Reception
Book Chapters: 2 and 3.

Week 1 Review of Signals and Systems. Fourier series. Fourier transforms.

Week 2 Review of Signals and Systems (cont). Linear, time-invariant systems. Nyquist Sampling Theorem.

Week 3 Linear, time-invariant systems (cont.).

Week 4 Analog Modulation techniques.

Week 5 Analog Modulation techniques(cont.) .

Week 6 *Midterm Exam* (1.5 hrs).

Part II: Probability Review and Digital Signal Transmission and Reception
Book Chapters: 4, 7, and 8 .

Week 7 Review of Probability Theory and Stochastic Processes.

Week 8 Review of Probability Theory and Stochastic Processes (cont.).

Week 9 Digital Communications. Optimum receivers in additive white Gaussian noise.

Week 10 Optimum Digital Receivers: The Matched Filter.

Week 11 Performance of Digital Receivers.

Week 12 Performance of Digital Receivers (cont.).

Week 13 Advanced Topics: M-ary Signal Sets. Carrier Modulation

Week 14 Advanced Topics: Random Phase Channels.

Tuesday May 12 *Final Exam* (10:30am – 1:15pm).