The Ohio State University
Department of Electrical and Computer Engineering

ECE 809 – Digital Communication Theory

Spring 2005

Instructor: Dr. Phil Schniter, Assistant Professor
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Web Page: `http://www.ece.osu.edu/~schniter/ee809`

Will contain homework, solutions, and relevant handouts.

Lectures: MWF 11:30am-12:18pm, 137 Caldwell

Office Hours: To be posted on course web page.

Objectives: A study of digital communication theory with an emphasis on performance, spectral characteristics, and complexity. Connections to statistical decision theory will be made.

Text: M. P. Fitz, *An Introduction to Digital Communication Theory*, 2004. Notes available from

`http://fitzmac.ee.ucla.edu/~fitz/TheoryText/EE230BW05+.pdf`

Optional Text: S. Benedetto and E. Biglieri, *Principles of Digital Transmission with Wireless Applications*, Kluwer, 1999.

Outline:

1. Complex Baseband Representation
2. Single Bit Optimum Communications
3. Multiple Bit Communications
4. Linear Modulations
5. Stream Modulations
6. Linear Stream Modulations
7. Linear Stream Modulations with Memory
8. Optimum Sequence Demodulation
9. Optimum Bit Demodulation.

Prerequisites: ECE-805

Grading: The course grade will be based on homework and projects ($\sim 30\%$), an in-class midterm ($\sim 30\%$), and a comprehensive final exam ($\sim 40\%$). Note: These weightings are approximate and may change. Some homework problems will require MATLAB computer programming and not necessarily all problems on each homework assignment will be graded.

Late Policy: No late material (projects, homework, etc.) will be accepted unless prior arrangements have been made. Arrangements need to be made at least 24 hours in advance. All emergency situations will be handled on a case-by-case basis.

Attendance: The student is responsible for all assignments, changes to assignments, announcements, and subject material presented during the regularly scheduled classroom lecture. Copies of lecture notes will not made available. If you miss a lecture, please obtain notes from a classmate.

Honor: All homework and examinations in this course will must be accomplished in accordance with the ECE Honor System. This means that *all submitted work must be your own.* While discussions among students relating to the homework are permitted (and often encouraged), a student's submitted assignment must reflect his/her *own* understanding of the material. Discussion of an exam is strictly prohibited until after the exam is submitted.