Course Description:

This course provides an introduction to analog and digital communications. The goal of communication systems is to reliably transmit information (random messages) produced at one location to another location. The random noise in the channel interferes with this goal. Transmission is performed by modulating deterministic signals. We shall first study important aspects of signals and systems theory, as well as of probability and random processes, that are relevant to communication theory. We shall proceed to study of the principles of digital and analog communication systems and analyze their performance. Contemporary issues will also be discussed.

Course Outline:

- Introduction (Chap. 1, Week 1)
- Review Signals and Linear Systems (Chap. 2, Week 2)
- Probability and Random Processes (Chap. 4, Weeks 3-5)
- First Test: Sept 29 (1/2 of Week 5)
- Digital transmission through additive white Gaussian channels (Chap. 7, Weeks 6-9)
- There will be no class on Oct 13 due to Columbus Day
- Second Test Nov 3 (1/2 of Week 9)
- Sampling and Pulse Code Modulation (Chap. 6, Weeks 10-11)
- Analog signal transmission and reception (AM, SSB, FM, PM) (Chap. 3, Weeks 11-12)
- Effects of noise on analog communication system (Chap. 5, Weeks 13-14)

Prerequisites: ECE 220 and STAT 346.

Attendance and homework:

1. Students are encouraged to attend all classes and to submit all homework assignments.

2. Homework assignments are due to the TA the week following their assignment. Students may submit and pick up their homework during recitation or at the TA’s mail box.

3. Coping solutions for assigned problems constitutes a violation of the university honor code.

Communication:

We will communicate via email. Please use yephraim@gmu.edu. Announcements, homework assignments and solutions will be emailed to you. I will use your email addresses which are on file at the GMU Registrar. If you wish to have your course material delivered to another email address, you may include a .forward command in your GMU directory. During the semester, please make sure that your mailbox is not full. Also, for each email message that you will be sending me, please write ece460 on the subject line.

Grading:

There will be two in class tests and a final. The lowest grade of the first two tests will be dropped. The remaining test and the final will each count for 50% of the final grade. Homework will count for additional 10% extra credit.