EE 343L Communication Systems Lab

**Designation:** Required for Systems Track students and elective for others.

**Catalog Description:** Experiments illustrating the basic principles of communication systems

**Credits:** 1

**Pre-requisites:** EE 315 Signal and Systems Analysis, EE 342 Probability and Statistics (corequisite), EE343 Introduction to Communication Systems (corequisite)

**Class/Lab Schedule:** one 3 hour laboratory per week

**Topics Covered:**
Lab is taken concurrently with EE343 and gives students practical and computer simulation experience. There is one preliminary writing assignment and nine labs covering:

- Introductory essay on Shannon (1 week)
- Fourier Analysis and Properties (2 week)
- Amplitude Modulation and Frequency Division multiplexing (2 weeks)
- Sampling and Time division multiplexing (1 week)
- Probability and Random Variables (1 week)
- Quantization and Pulse Code Modulation (1 week)
- Pulse Shaping (1 week)
- Matched Filters (1 week)
- Performance of Digital Communication Systems (2 weeks)
- Spread Spectrum Systems and Code Division Multiplexing (1 week)

**Text Book and Other Required Materials:** Digital and Analog Communication Systems Lab Handouts

**Course Objectives and Their Relationship to Program Objectives:**
This lab course complements EE343 as students conduct experiments with signals, systems, and communication systems. Systems are built and verified through matlab and analytically. [Program Objectives this course addresses: 1, 2, and 3.]

**Writing Intensive Focus:**
Students will not receive passing credit for the class without accomplishing the writing objectives of the course. Each lab report will be given a review with feedback, and the student will be expected to revise the lab report to account for the feedback. Each lab grade will be based on the final revision submitted and assessed according to the quality of the technical writing as well as the correctness of the report. Each of the write ups for the ten lab reports are worth 4% of your grade, for a total of 40%. Each lab report will consist of at least two pages of write up for a total of at least 20 pages of write up. There will also be a final worth 20% with lab participation and technical content of reports worth a total of 40%.
**Computer Usage:**
Students use Matlab to design and simulate different communication systems and study signal and system properties.

**Design Credits and Features:**
EE 343L has 1 unit of design credit. In the laboratories, students design and build different communications systems using Matlab tools.