Course Syllabus

ELCT 332 – Fundamentals of Communication System

Course Coordinator: David W. Matolak, Ph.D.

Catalog Description: Introduction to communication systems, sampling theorem, modulation theory, multiplexing, random processes for communication systems, baseband digital signaling, and related topics.

Credit Hours 3

Prerequisite(s) by course ELCT 321 and STAT 509

Prerequisite by topics Probability/Statistics, Linear System Theory


Other Materials Class notes posted on Blackboard

Course Outcomes:
Students who successfully complete the course will be able to:

- Demonstrate competency in signal analysis: identifying continuous- vs. discrete-time signals, deterministic vs. random signals, periodic signals, and relation of time domain to frequency domain characteristics.
- Show ability to apply signal concepts to communication systems: explain and analyze operations of modulation, time-shifting, filtering (lowpass, highpass, and bandpass), demodulation, noise effects, sampling and quantization.
- Communicate in a written professional form
- Evaluate cost and performance tradeoffs of various communication system options.

Course Topics:

- Introduction to communication systems
- Signal representations and Fourier transforms
- Amplitude modulation, frequency translation
- Angle modulation: PM, FM, PLL, non-linear effects
- Multiplexing, superheterodyne receivers, signals through systems
- Probability & random processes, statistics, correlations, spectral density
- Noise and its characterization, effects on analog modulation
- A/D, sampling theorem, PAM, quantization and PCM
- Baseband digital signaling, matched filter, error probability
- ISI, Nyquist criterion, comparison of baseband digital signaling schemes

Course Contribution to Program Outcomes:
ELCT 332 contributes to an achievement of:

- Outcome A: an ability to apply knowledge of mathematics, science and engineering
- Outcome E: an ability to identify, formulate, and solve engineering problems
Overall Course Policies

Academic Integrity
Unless otherwise stated, assignments and examination work are expected to be the sole effort of the student submitting the work. Students are expected to follow the University of South Carolina Honor Code and should expect that every instance of a suspected violation will be reported. Students found responsible for violations of the Code will be subject to academic penalties under the Code in addition to whatever disciplinary sanctions are applied.

University of South Carolina Honor Code
It is the responsibility of every student at the University of South Carolina Columbia to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. Any student who violates this Honor Code or who knowingly assists another to violate this Honor Code shall be subject to discipline.

Information on Office of Academic Integrity sanctions can be found at http://www.housing.sc.edu/academicintegrity/sanctions.html. One or more of the following Academic Integrity Sanctions may be imposed for violations:
1. Expulsion from the University
2. Suspension from the University for a period of no less than one semester; and/or Probation
A combination of the above sanctions may also be imposed.

Accommodating Disabilities
Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.

Diversity
In addition to scheduling exams, I have attempted to avoid conflicts with major religious holidays. If, however, I have inadvertently scheduled an exam or major deadline that creates a conflict with your religious observances, please let me know as soon as possible so that we can make other arrangements.

Recommended Study Habits
- Read the assigned material before class.
- Bring thoughtful questions to class for discussion.
- Prepare for the exams in study groups.
- Take notes during class discussions and while completing reading assignments.

Amending the Syllabus/Rules
Amendments and changes to the syllabus, including evaluation and grading mechanisms, are possible. The instructor must initiate any changes. Changes to the grading and evaluation scheme must be voted on by the entire class and approved only with unanimous vote of all students present in class on the day the issue is decided.