Catalog Data:

ECE 422 - COMMUNICATION SYSTEMS LABORATORY [1 1/2 hrs]
Prerequisite: EE 324
Corequisite: EE 420

Objective

To give the student first-hand exposure to communications practice, including response of systems, signal theory, analog modulation and detection, sampling and quantization, digital transmission, digital signal processing, receiver design, and satellite systems.

Textbook:

Laboratory Manual for ECE 422 (required and available at Newcomb Hall), S.G. Wilson

Coordinator:

Stephen G. Wilson, Professor of Electrical Engineering

Teaching Assistant:

Sean Happel
C-249, sth3c@virginia.edu

Syllabus:

Will follow laboratory manual, unless otherwise advised. Later experiments may be reordered to better match 420 lecture material.

Lab Format:

Students will work in two or three person groups, following an introductory discussion, for which students should be prepared to participate. Normally the experiments will be completed during lab time. Each student is expected to maintain a bound laboratory notebook. One summary report per group is expected for each lab, due the week following its performance. This may include a short follow-up design exercise building upon the laboratory material.
Topics:

(1) Response of Linear Systems in Time and Frequency
(2) Nonlinear Effects on Signals
(3) Spectrum Analysis and Noise Characterization
(4) Linear Modulation: DSB-AM, DSBSC, SSBSC
(5) Demodulation of AM Signals and Performance in Noise
(6) Angle Modulation: FM and PM
(7) Demodulation of FM and PM Signals
(8) Sampling and Quantization
(9) Pseudo Random Sequences/Digital Modulation and Detection
(10) Statistics and Digital Signal Processing
(11) Receiver Principles
(12) Design and Test of Passive Filters (probably omitted)
(13) Digital Signal Processing (hardware digital filtering, FFT)

Grading

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<tr>
<th>Component</th>
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<tbody>
<tr>
<td>Lab Preparation</td>
<td>20%</td>
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<tr>
<td>Prelabs; knowing what’s happening ahead of time</td>
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<tr>
<td>Laboratory Performance</td>
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<td>Thoroughness; laboratory technique; thinking....</td>
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<tr>
<td>Notebook</td>
<td>20%</td>
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<tr>
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