

TECHNOLOGY 378: Communication System Design I

2007-08 Catalog Data: Communication System Design I (3 Credits)

Catalog Description: This course introduces students to the basic theory and application of communication systems. Emphasis is on signal representation, modulation/ demodulation techniques, and communication hardware. The effect of noise in communication systems, signal to noise ratio, and bandwidth are considered.

Prerequisites: MATH 229 and TECH 276 or consent of department

Co-requisites: TECH 378A

Textbooks:

- Tomasi, Wayne, (2004). Electronic Communications Systems: Fundamentals Through Advanced, Prentice Hall, ISBN 0-13-049492-5.

Reference:

- Young, Paul, H., (1999) Electronic Communication Techniques, Fourth Edition, Prentice-Hall, ISBN 0-13-779984-5.

Instructor: Dr. Abul K. M. Azad

Learning Objectives	Relational ABET Learning Outcomes
Understanding the relationship between bandwidth and information capacity, and analyze signals via Fourier analysis.	A. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines. B. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology. C. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes. F. An ability to identify, analyze and solve technical problems.
Understanding of noise and signal behavior along with significance of noise reduction in communication process.	A. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines. B. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology. C. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes. F. An ability to identify, analyze and solve technical problems. N. An ability to use modern laboratory techniques, skills, and/or equipment effectively.
Understanding of various modulation and demodulation concepts as used in an analog communication system.	A. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines. B. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology. C. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes. F. An ability to identify, analyze and solve technical problems. N. An ability to use modern laboratory techniques, skills, and/or equipment effectively.

<p>Familiarization with systems and communication hardware that make up a transmitter and receiver for AM, FM, and PM signals.</p>	<p>O. An ability to manage projects effectively.</p> <p>A. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.</p> <p>B. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.</p> <p>C. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes.</p> <p>D. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives.</p> <p>F. An ability to identify, analyze and solve technical problems.</p> <p>N. An ability to use modern laboratory techniques, skills, and/or equipment effectively.</p>
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Topics Covered:

- Introduction to Electronic Communication
- Signal Generation
- Amplitude Modulation Transmission
- Amplitude Modulation Reception
- Single-Sideband (SSB) Communication Systems
- Angle Modulation Transmission
- Angle Modulation Receivers and Systems

Computer Usage: Students will make use of MS Word in the preparation of laboratory reports during the semester.

Laboratory Projects: There is a laboratory course TECH 378A, which students are taking as a part of this teaching course. Under this laboratory course, they will perform about 12 experiments to verify and study various theories and phenomena learned through the lecture class.