EE 536
DIGITAL COMMUNICATIONS

Instructor: Prof. Dr. Yalçın Tanık (D-209)

Text: J.G. Proakis, "Digital Communications," 4'th Ed., 2001, Mc Graw-Hill.

Grading

- A closed-book Midterm Exam (30%)
- A Take-Home Exam (30%)
- Final Exam (40%)

Tentative Outline

Characterization of Communication Signals ans Systems
- Representation of Bandpass Signals and Systems.
- Representation of Digitally Modulated Signals.
- Spectral Characterization of Digital Signals.

Optimum Receivers for AWGN Channels
- Fundamentals of Optimum Receivers for AWGN Channels.
- Performance of the Optimum Receiver for Memoryless Modulation: Binary, Orthogonal, Biorthogonal, Simplex, PAM, PSK, QAM Signals.
- Comparison of Digital Modulation Methods.
- Optimum Receiver for CPM Signals.

Carrier and Symbol Synchronization
- Carrier Phase Estimation.
- Tone Tracking with PLL.
- Some Practical Carrier Synchronizers.
- Symbol Timing Estimation.

Signal Design for Bandlimited Channels
- Nyquist-1 Criterion.
- Signal Design for Channels with Distortion.

Communication Through Bandlimited Linear Channels
- Discrete-Time Communication System Models.
- Maximum Likelihood Sequence Estimation and the Viterbi Algorithm.

Adaptive Equalization
- Linear Equalization: Peak Distortion and Mean Square Error Criteria.
- The LMS Algorithm.
- Adaptive Decision Feedback Algorithm.
- Recursive Least Squares (Kalman) Algorithm.