

THEORY OF DIGITAL COMMUNICATION

Tue Thu 5:30 pm — 6:50 pm, ECC Bldg. - Studio A

Instructor: Nam Phamdo

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Office Hours: Wed Fri 10:00 am — 12:00 pm; also by appointment

Course Outline: The course covers the principles of digital communication. Particular topics include:

1. Overview: of communication and digital communication, some factors involving cost.
2. Signal Representation: deterministic and random signal representations, orthogonal decomposition, bandlimited signals and the sampling theorem.
3. Source Coding: source models, lossless and lossy source coding, Huffman code, Lloyd-Max quantization, vector quantization, theoretical limits on performances of data compression schemes.
4. Channel Coding: discrete channel models, block codes, Hamming codes and sphere-packing bound, convolutional codes and Viterbi algorithm, theoretical limits (Shannon capacity).
5. Data Transmission: waveform channel models, pulse amplitude modulation, phase shift keying, Viterbi algorithm with soft-decision decoding, trellis-coded modulation, theoretical limits (Shannon capacity).

Prerequisites: A graduate-level course in probability and random process (ESE 503).

Textbook: J. G. Proakis and M. Salehi, *Communication Systems Engineering*, Prentice-Hall, 1994.

Homeworks: will be given but will not count toward the final grade.

Quizzes: A 40-minute quiz will be given every other week (at the beginning of class on 9/15/97, 9/29/97, 10/13/97, 10/27/97, 11/10/97, 11/24/97). Only the five highest quiz scores will be counted toward the final grade. Any student who misses a quiz will be given a “zero” for that quiz. Absolutely no make-up quiz will be given.

Grading:

Quizzes	50%
Final Exam	50%

The Final Exam will be held on **Thursday, December 17, 1998 at 3:30 — 6:30 pm.**

If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, I would urge that you contact the staff in the Disabled Student Services office (DSS), room 133 Humanites, 632-6748/TDD. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate. All information and documentation of disability is confidential.