

Introduction to Data Communication Networks

EE 424/504 Fall 2006

- Class Info:** Meeting time: 11:10-12:30 Tuesday and Thursday
Location: Engineering Building 240
- Instructor:** Laurie Joiner
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Office: EB 217-B
Phone: 824-6126
- Office Hours:** Tuesday and Thursday 4:00-5:00, Monday 11:00-12:00, 2:00-3:00
- Prerequisites:** EE 383 Analytical Methods for Multivariable and Discrete Time Systems
- Required Text:** W. Tomasi, *Electronic Communications Systems: Fundamentals through Advanced*, 5ed, Prentice Hall, 2004.
- References:** B. Sklar, *Digital Communications*, 2ed. Prentice Hall, 2001
R. Ziemer and R. Peterson, *Introduction to Digital Communication*, 2ed, Prentice Hall, 2001.
H. Stern and S. Mahmoud, *Communication Systems Analysis and Design*, Prentice Hall, 2004.
- Objectives:** By the end of the semester you should be able to:
- Define and describe various digital modulation techniques
 - Design optimal receivers and develop error performance equations for FSK, PSK, and QAM
 - Define and describe pulse code modulation
 - Define multiplexing and understand its use in the T1 digital carrier system
 - Describe the operation and basic functions of a standard telephone set.
 - Describe the transmission characteristics of a local subscriber loop
 - Describe the basic operation of a cellular telephone system
 - Describe the error-correction mechanisms of FEC, ARQ, and Hamming codes
- Topics covered:** Introduction
Digital communication system
Frequency domain analysis
Bandwidth
Autocorrelation
Digital Modulation
Modulation techniques
Synchronization
Probability of error and bit error rate
Digital Transmission
PCM
Coding methods
Digital T-Carriers and Multiplexing
Time-division multiplexing
T1 digital carrier
Frequency-division multiplexing
Public Telephone Network
Local subscriber loop
Transmission impairments
Spread spectrum communications
Direct sequence
Frequency hop
Cellular Telephone Concepts
Cells and frequency reuse

PCS, N-AMPS, GSM
Data Communications and Networking
Error control and error correction
Data Link Protocols

Grading:	Homework	20 %	
	Two in-class tests	25 %	
	Final exam	30 %	
	Final average of:	90 – 100	A
		80-89	B
		70-79	C
		60-69	D
		< 60	F

Graduate level: You will be asked to write a short report on a subject related to data communications. You will present your report to the class in a conference style format (approximately 20 minute presentation). You will be graded on your report and presentation. This will be part of your homework grade.

Academic

Honesty: All work submitted for the tests and final must be your own unaided work. Collaboration on homework and laboratories is permitted, but solutions must be your own. Anything in the written project not in your own words must be properly quoted and cited.

Web Site: A web site for this course will be maintained at <http://www.ece.uah.edu/~ljoiner/ee424>. Any course handouts and all homework assignments will be posted to this page.

Final Exam: The final exam is on Tuesday, December 12 from 11:30 am-2:00 pm.