

Subject: NC 7228 Error Control Coding

Instructor: Cheng-Ying Yang, Ph.D.

Meeting hours: Monday 09:10-12:00

Textbook: Shu Lin, Daniel J. Costello, Jr., *Error Control Coding: Fundamentals and Applications*, 2nd ed., Prentice-Hall, 2004.

Contents:

1. Overview of Digital Communication System
2. Quantization and Source Coding, Huffman Coding
3. Markov Processing and Predictive Encoder
4. Entropy and Shannon First theorem
5. Coding and Modulation Trade-off
6. Error Control coding – Memoryless coding
7. Error Control coding – Convolutional codes

Project: Computer Simulation for coding schemes including Block coding and Convolutional coding, due 5/29/2006.

Reading Assignment:

One paper with the topics relating to Low-Density Parity Check Codes. Due 6/5/2006.

Grading:	Midterm	30%
	Final	40%
	Project (including report)	15%
	Report, Assignment:	15%

Reference:

1. Ranjan Bose, *Information Theory Coding and Cryptography*, Tata McGraw Hill, 2002.
2. Richard W. Hamming, *Coding and Information Theory*, Prentice-Hall, 2nd ed., 1986.
3. John G. Proakis, Masoud Salehi, *Contemporary Communication Systems using Matlab*, Books/Cole, 2000.
4. Simon Haykin, *Digital Communications*, Wiley, 1988.
5. Stephen G. Wilson, *Digital Modulation and Coding*, Prentice Hall, 1996.
6. Bernard Sklar, *Digital Communications fundamentals and Applications*, Prentice-Hall, 2001
7. Richard B. Wells, *Applied Coding and Information Theory for Engineers*, Prentice Hall, 1999.
8. Branka Vucetic and Jinhong Yuan, *Turbo Codes Principle and Applications*, Kluwer Academic Publisher, 2000.