

EE 5501 - Digital Communication
Fall 2009

Course Information

Instructor: Nihar Jindal, 6-119 EE/CS, nihaar@umn.edu, 625-6306

Class Time and Location: Tues/Thur, 11:15 AM - 12:30 PM, MechE 102

Office Hours: Tues/Thurs, 1:30 - 2:30 PM, 6-119 EE/CS

Class Webpage: <http://www.ece.umn.edu/class/ee5501/index.html>

Required Textbook: *Fundamentals of Digital Communication*, U. Madhow, Cambridge University Press, 2008.

Prerequisite: Undergraduate signals & systems (EE 3015), probability (EE 3025), and communications (EE 4501)

Homework: Weekly.

Exams: There will be two midterm exams and a final exam (Saturday, Dec. 19, 4-6 PM).

Grading Policy: 30% homework, 20% each midterm, 30% final.

Course Outline

1. Digital Communication Basics

Baseband-passband representations, Nyquist pulse shapes, signal space representation, optimal receiver design, error probability computation.

2. Capacity and Channel Coding

Information theoretic notion of channel capacity, convolutional coding, turbo coding.

3. Channels with Inter-Symbol Interference

Equalization, orthogonal frequency division multiplexing (OFDM), spread spectrum.

4. Synchronization

Timing and carrier synchronization, noncoherent communication.