

# EE 5505 - Wireless Communication Spring 2010

## Course Information

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

**Class Time and Location:** Tu/Th, 11:15 AM - 12:30 PM, ME 108

**Office Hours:** Mon 2-3, Thurs 1:30 - 2:30, 6-119 EE/CS

**TA:** Peng Wu, ultra.pengwu@gmail.com

**TA Office Hours:** Wed, 1-2:30, 2-127 EE/CS

**Class Webpage:** <http://www.ece.umn.edu/class/ee5505/>

**Required Textbook:** *Wireless Communication*, Andrea Goldsmith, Cambridge University Press, 2005.

**Prerequisite:** EE 4501 or an equivalent undergraduate communications course is required; EE 5501 (Digital Communication) or an equivalent graduate digital communications course is recommended. Familiarity with MATLAB will be useful.

**Homework:** Approximately weekly.

**Exams:** One midterm exam (date TBD) and a final exam (Tuesday, May 11, 8-10 AM).

**Project:** A project is a required portion of this course. The project will either be on a wireless communication standard (e.g., IEEE 802.11n) or on a research topic. The project will be due towards the end of the semester, and detailed will be provided later.

**Grading Policy:** Final grade will be 10% project, 20% midterm, 35% homework, and 35% final.

## Course Topics

### 1. Wireless Channel Models

Path Loss, Shadowing, Statistical Models for Narrowband and Wideband Fading

### 2. Digital Communication in Wireless Channels

Performance of Digital Modulation in Fading Channels, Channel Coding & Capacity, Adaptive Modulation & Coding, Diversity, ARQ

### 3. Digital Communication in Wideband Fading

Equalization, OFDM, Spread Spectrum

### 4. Multi-User Systems

Multiple Access, Scheduling, Multi-User Capacity Limits

### 5. Multiple Antenna Communication