EEN 562 Wireless and Cellular Communications (3 credits)

Department of Electrical and Computer Engineering
University of Miami
Fall 2005

Course Description: This course focuses on fundamentals of wireless communications and is intended to convey the basic ideas governing their designs. Although most principles discussed hold for a variety of systems, the primary focus is on cellular communications. Upon completion of this course, you shall be able to achieve a good understanding of basic ideas behind the design of modern wireless systems, as well as associated practical issues. You shall also be able to apply what you have learned to solving certain real-world wireless communication problems, and read advanced textbooks or research literature in related areas.

Prerequisites: EEN 404 Communication Systems

Textbook: *Wireless Communications and Networking,* Jon W. Mark, Weihua Zhuang, Prentice Hall, 2003 (ISBN: 0-13-040905-7).

References:

1. *Wireless Communications: Principles and Practice*, 2nd Edition, Theodore S. Rappaport, Prentice Hall, 2001 (ISBN: 0-13-042232-0)
2. *Microwave Mobile Communications,* W. C. Jakes, Jr. (editor), Wiley, 1974

Course Objectives: This course is designed to introduce students to:

1. the fundamental principles involved in the theory and design of wireless systems,
2. important issues and tradeoffs involved, primarily, at the physical and medium access control layers of wireless systems, and
3. wireless standards

Instructor: Dr. Xiaodong Cai, Room 513 Engineering Building,
Tel: (305) 284-5329, e-mail: x.cai@miami.edu,
Office hours: T R 1:00pm – 2:00pm and by appointment

Class Schedule: T R 2:00 pm – 3:15 pm, EB 502

Topics:

1. Overview of Wireless Communications
2. Path Loss, Shadowing, and Fading Models
3. Digital Modulation and its Performance
4. Diversity Reception, Equalization, and OFDM
5. Error Control Coding
6. Introduction of Cellular Systems
7. Multiple Access: FDMA, TDMA, CDMA, and Aloha
8. Mobility Management

Grading: Homework: 10%, 1 project 10%, 4 quizzes: 20%, 1 midterm exams: 20%, final exam: 40%, bonus up to 5% for attendance

Exam Policy: The midterm and final must be taken at their scheduled times. Exceptions are only made in rare circumstances, typically due to a medical or family emergency. The lowest quiz will be dropped.

Homework Policy: In general there is one homework assignment per week. The homework is due at the beginning of the class on the day it is due. The solution for the homework will be on the class website. Homework will lose 25% credit per day late. After the solution is posted, no homework will be accepted. The lowest homework will be dropped.

Project Policy: Discussing general strategies for approaching project assignment with classmates is encouraged. You should do experiments and write your report on your own.