

# **Fundamentals of Wireless Systems and Protocols**

ECGR6090X90/8090X90 - Fall 2010

## **Instructor:**

Dr. Linda J. Xie

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Office Hours: Tuesday and Thursday 2:30-3:30pm (or by appointments)

## **Teaching Assistant:**

N/A

## **Lecture Schedule:**

Tuesday and Thursday 6:30pm--7:45pm, Woodward 140

## **Course Website:**

The course website is available through **Blackboard**. All the course-related handouts, assignments, and announcements will be posted at the course website. It is accessed via **49er Express**, in the **MyCourses** area.

## **Course Content:**

This is an introductory course to wireless systems. The course provides an overview of different wireless and mobile network standards and systems. It further covers the distinct characteristics of these wireless systems that require a fundamental redesign of protocols at layer 2 to layer 4 of the network protocol stack. This course involves the study of the impact of wireless network characteristics on existing network protocols and newer protocols that are suited to such characteristics. Protocols for medium access control, routing, and reliable transport, in addition to middleware and applications custom-made for wireless networks will be dealt with.

The goal of this course is to impart state-of-the-art technologies of wireless networking and motivate students' interest in further studies of advanced courses in telecommunications.

## **Textbook:**

No official textbook is required. Homework and exams will be based on lecture notes. A list of reference books and papers will be given throughout the lectures.

### **Reference Books:**

- D. P. Agrawal and Q.-A. Zeng, *Introduction to Wireless and Mobile Systems*, Second Edition, Thomson, 2005.
- T. S. Rappaport, *Wireless Communications*, Second Edition, Prentice Hall, 2002.
- Y. B. Lin and I. Chlamtac, *Wireless and Mobile Network Architecture*, John Wiley & Sons, 2000.

### **Prerequisites:**

The course is designed for students who have already had a first course in networking and in particular in the architecture and protocols used within the Internet. Students are expected to have a basic understanding of the fundamental concepts of computer networks, for example, the OSI protocol stack, medium access, routing, TCP/IP, etc.

### **Grading:**

There are two homework assignments, four-six **in-class close-book/notes** quizzes, two **in-class close-book/notes** midterm exams, and a final project required for this course. They will count toward the grade as follows:

Homework:	10%
Quizzes:	15%
Midterm 1:	25%
Midterm 2:	25%
Final Project:	25%

### **Tentative Course Outline:**

The following topics will be covered as time permits:

- Overview of Wireless Networks
- Fundamentals of Cellular Networks
- Cellular Networking (1G, 2G)
- Next Generation Cellular Networks (GPRS, UMTS, 3G and Beyond)
- Wireless Local Area Networks (WLANs)
- Wireless Personal Area Networks (WPANs)
- Mobile IP
- Ad Hoc Networking
- Wireless Sensor Networks
- Wireless Mesh Networks

## Course Policies:

- Class attendance is a responsibility of each individual. If a student chooses not to attend class, he/she is responsible for any handouts, announcement, and contents of missed lectures.
- There will be **no make-up exams**. Students who cannot attend an exam with health emergency must show official proofs.
- Assignments are due at the beginning of the class. Assignment solutions will be provided. Late assignments are not accepted and will have a **grade of zero**.
- All assignments are assumed to be an **individual effort** unless otherwise specified by the instructor.
- If you end up doing poorly in the class, please **DO NOT** ask for "extra work" to raise your grade. This would not be fair to other students.

## Students with Disabilities:

Students in this course seeking accommodations to disabilities must first consult with the Office of Disability Services (<http://www.ds.uncc.edu/>) and follow the instructions of that office for obtaining accommodations.

## Academic Integrity:

All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code. The Code is available from the Dean of Students Office online at <http://www.legal.uncc.edu/policies/ps-105.html>

The following is strictly prohibited:

- Copying, with or without modification, someone else's work when this work is not meant to be publicly accessible (e.g., a classmate's program or solution).
- Submission of material that is wholly or substantially identical to that created or published by another person, without adequate credit notations indicating authorship (plagiarism).

You are encouraged to discuss problems and papers with others as long as this does not involve copying of code or solutions. Any public material that you use (open-source software, help from a text, material you find on the web, material from a paper, substantial help from a friend, etc...) should be acknowledged explicitly in anything you submit.

If you have any doubt about whether something is legal or not, please do check with the Instructor.

## Note:

The standards and requirements set forth in this syllabus may be modified at any time by the course instructor. Notice of such changes will be by announcement in class.