

***NEW Course:* ELEN 689-602: Mobile Wireless
Networking, Fall 2005**

INSTRUCTOR: Professor Xi Zhang, 315B WERC, 689_wireless@ece.tamu.edu
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CLASS: Tue. & Thur. 4:00-5:15PM

ROOM: ZACH 128D

OFFICE HOURS: Tue & Thur: 5:20-6:20 PM or By Appointment

COURSE DESCRIPTION:

This graduate course provides an in-depth study of principles, architectures, protocols, and modeling techniques for mobile wireless networks. The course aims at equipping graduate students with not only a solid foundation and the state-of-the-art knowledge in a wide spectrum of wireless communications techniques and protocols, but also the rigorous analytical capabilities to evaluate the performance of complex mobile wireless systems and networks. As a research-oriented class, this course will also introduce students to the emerging and hot topics in mobile wireless networking and mobile computing research.

The course will start with an introduction of the fundamental architectures and principles of mobile and wireless networks and their relationships with the backbone Internet. The focus will then move on to the main wireless communication theories and modeling techniques used in mobile wireless networks. This is followed by the detailed examinations of a number of most recently developed mobile wireless networking technologies and architectures. Several types of widely employed mobile wireless networks and research topics are investigated in-depth as the further applications of the newly developed wireless networking techniques.

The course material consists primarily of the classic and recent technical papers published on major wireless/wired networking journal and conferences and the referenced (recommended, but not required) text books.

The course also aims at introducing new graduate students to research, as well as exploit potential topics for MS comprehensive projects and PhD research directions.

PREREQUISITE: An introduction-level class on “Computer Networks” and knowledge of C++ programming, or consent of the instructor.

Textbook: Classic and Recent selected research papers and the referenced (recommended but not required) text books are as follows: (1) T. Rappaport: “Wireless Communications Principle & Practice” Prentice Hall, 2004, (2) Gordon L. Stüber: “Principles of Mobile Communication”, Kluwer Academic Publishers, 2001.

Grading (Tentative): Assignments: 20%; Projects: 40%; Exams: 40%.

Course Outline (Tentative):

- Fundamental architectures of mobile and wireless networks
- Mobile networking over Internet through wireless accessing
- TCP/IP protocols over wireless links
- Antennas/propagation and multi-path fading channel modeling
- Spread Spectrum, CDMA, MC-DS-CDMA, and MIMO-OFDM
- Error resilience and channel coding over wireless channels
- Cross-layer design and optimizations based Wireless QoS guarantees
- IEEE 802.11 (WLAN) families, multiple access, and protocols
- Adapting IEEE 802.11 to multimedia and QoS supported WLANs
- Mobile multicast over Mobile Wireless Networks
- Mobile Ad Hoc networks and wireless sensor networks
- Wireless network security

We’re still recruiting PhD/MS students to conduct research in the areas of Wireless Mobile Networking and the Internet. For the interested students, please see my web page at:

ece.tamu.edu/~xizhang