

EEL 6591 Wireless Networks

Credits: 3 credits

Textbook, Title, Author, and Year: "Wireless Communications and Networks 2/E", by William Stallings, Prentice Hall Publishing Company, 2004. ISBN 0-13-191835-4.

Reference materials: N/A/

Specific Course Information

Catalog Description: In this course, we will discuss basic concepts and recent advances in the field of wireless communication networks. The course begins with an introduction to the fundamentals of wireless communication technology and continues with a discussion of selected topics for the following representative network types: cellular networks, WPANs, WLANs, ad-hoc wireless networks, and wireless sensor networks. Recent technologies presented include IEEE 802.11, IEEE 802.16 (WiMax), IEEE 802.15.4 (ZigBee), Bluetooth.

Prerequisites: Prerequisites: CNT4104 Introduction to Data Communication or equivalent

Specific Goals for the Course:

- Students will be able to explain the fundamentals of wireless data communication (Antennas and Propagation, Signal Encoding Techniques, Spread Spectrum, Coding and Error Control)
- Students will solve problems involving link power budgets, antenna parameters and limits to fundamental limits to data rate
- Students will explain the operation of the IEEE 802.11 and WiMax protocols
- Students will explain the operation of the Bluetooth protocol
- Students will be able to describe architectures for ad-hoc wireless networks

Brief List of Topics to be covered:

1. The ns2 Network Simulator
2. Technical Background: Transmission Fundamentals, Communication Networks, Protocols and the TCP/IP Suite
3. Wireless Communication Technology: Antennas and Propagation, Signal Encoding Techniques, Spread Spectrum, Coding and Error Control
4. Cellular Wireless Networks
5. Wireless Ethernet
6. WiMax, Bluetooth
7. Ad Hoc Wireless Networks and Wireless Sensor Networks