CSCE 3510.001 / EENG 4010.002: Introduction to Wireless Communications

Instructor: Dr. Kamesh Namuduri
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Fall 2012
Time: (T/Th) 11:00 -12:20 pm
Meeting Place: NTDP B227

Teaching Assistant: Mr. Prakash Duraisamy, B245
TA Office Hours: Tuesday 9-11 PM, Thursday 3-5 PM (other times by appointment)

Course Description:

Fundamentals of wireless communications and networking, with emphasis on first, second, third, and fourth generation cellular systems. Topics include point-to-point signal transmission through a wireless channel, cellular capacity, multi-user transmissions, and mobility management.

Course Objectives:

By the end of the course, you be able to

- Understand the basic modules in a digital communication system
- Learn wireless networking concepts such as channel modeling, modulation schemes, and multiple access methods
- Understand the evolution of wireless and cellular communication systems
- Simulate an end to end digital communication system
- Understand security aspects in wireless communication systems
- Understand the policy issues governing spectrum allocation

Course Requirements:

Class participation is required. Lectures, videos, and class discussions will contain vital information needed to do well on the exams.

Text Book:

(1) Wireless Communications and Networks, 2nd ed., William Stallings, Prentice Hall, 2005, ISBN 0-13-191835-4.

(2) Supplemental text: MATLAB Student Edition

References

1. Fundamentals of Wireless Communication Engineering Technologies by K. Daniel Wong, ISBN: 978-0-470-56544-5

Grading:

Homework	30%
Project	30%
Midterm	20%
Final	20%

Academic Dishonesty: Any form of cheating in home works, assignments, and examinations may result in "F" grade for the entire course.

Disabilities Accommodation:

The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.

Syllabus:

- Transmission Fundamentals
  - Analog and Digital Transmission
  - Channel Capacity
  - Multiplexing
- Antennas and Propagation
  - Radiation, Types and Gain
  - Ground Wave, Sky Wave, Line-of-Sight
  - Fading
- Signal Encoding Techniques
  - ASK, FSK, PSK, QAM
  - Amplitude Modulation
  - PCM
- Spread Spectrum
  - Frequency Hopping
  - Direct Sequence
  - CDMA
- Cellular Technologies
  - First Generation
  - Second Generation
  - Third Generation
  - Fourth Generation
- Coding and Error Control Techniques
  - CRC
  - BEC
  - Convolutional Codes
- IEEE 802.11 Wireless Protocols, Architecture, Medium Access Control, and Physical Layer