EENG 4010.002 and EENG 5940-002: Introduction to Wireless Networks and Communications

Instructor: Dr. Kamesh Namuduri
Office: NTDP B234
Office Hours: T/Th: 2-3 pm
Phone: 940-369-8960
Email: kamesh.namuduri@unt.edu

Teaching Assistant: Ms. Ashley Mitchell
TA Office Hours: Mondays and Wednesdays 2-3 PM
Tuesdays and Thursdays 3-4 PM

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 will 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:

Grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>30%</td>
</tr>
<tr>
<td>Project</td>
<td>30%</td>
</tr>
<tr>
<td>Midterm</td>
<td>20%</td>
</tr>
<tr>
<td>Final</td>
<td>20%</td>
</tr>
</tbody>
</table>
**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