

# CSCE 4520/5520, Wireless Networks and Protocols

Instructor: Ram Dantu  
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Fall '2015  
Time: MW ( 1:00 -3:30 pm)  
Meeting Place: NTDP F206

## Current Catalog Description:

Architecture and elements of a wireless network. Use and process of micro and macro mobility management. Signaling schemes used in wireless networks, network signaling, protocols and standard (IS-95, CDMA2000, IS41). Quality of Service (QoS) in voice and data services in cellular networks; Operation of Wireless LAN networks (WLAN); Analysis of the operation and performance of wireless protocols.

## Textbook:

No particular book but several references and handouts in the class. These books give core principles of cellular networks planning and operation. In this class we extend these principles to 4G and probably 5G.

## References:

1. K. Pahlavan and P. Krishnamurthy, *Principles of Wireless Networks*, Prentice Hall, 2002, (ISBN: 0130930032).
2. Michael D. Gallagher, Randall A. Snyder, "Mobile Telecommunications Networking with IS-41", McGraw-Hill, 1997.
3. Randall Nichols, Panos Lekkas, "Wireless Security, Models, Threats, and Solutions", McGraw-Hill, 2002
4. Lawrence Harte, Morris Hoening, Daniel McLaughlin, Roman Kta, "CDMA IS-95 for Cellular and PCS", McGraw-Hill, 1999.
5. Harri Holma, and Antti Toskala, " WCDMA for UMTS", John Wiley & SONS, 2000, ISBN: 047172051
6. QUALCOMM Student Guide, Book1-Book4, "CDMA for Third Generation Wireless Systems", QUALCOMM Incorporation, 2000.
7. [www.3gpp.org](http://www.3gpp.org)
8. [www.3GPP2.org](http://www.3GPP2.org)
9. [3G Access Network Specification](#)

## Course Outcomes:

1. Basic operation of a cellular network.
2. Understanding basic operation of different network elements of a cellular network.
3. Basic understanding of soft and hard handoff.
4. Basic understanding of function of interfaces between BTS, BSC, MSC and PSTN.

5. Understanding basic issues related to supporting QoS in voice and data services in cellular networks
6. Understanding basic operation of wireless LAN networks.

**Prerequisites by Topic:**

CSCE 3600

**Major Topics Covered in the Course:**

<b>Topic</b>	<b>Comments (L1 stands for lecture1)</b>
Overview of Wireless Network Operation	L1, L2, L3
Overview of different technologies and protocols, 2G, 2.5G, 3G, 4G, GSM, CDMA, SS7 transport protocols	L4, L5, L6
MS-BTS/BSC interfaces and protocol layers (A1-A12 interfaces)	L7, L8
Connection Management	L9, L10
BSC-BSC interface and Radio Resource Mgmt	L11, L12
MSC-MSC interfaces and protocols	L13
Test1	
Data over wireless networks	L14, L15, L16, L17, L18
WiFi Protocol	L19, L20, L21, L22
Seminars by students	L23, L24
Seminars by students	L25, L26,L27,L28
Test2	

**GRADING SCHEME**

- 5% -- Homework 1 and Quiz1
- 5% -- Homework 2 and Quiz2
- 5% -- Homework 3 and Quiz3
- 5% -- Homework 4 and Quiz4
- 10% -- Project 1
- 10% -- Test1
- 10% -- Project 2
- 15% -- Project 3
- 10% -- Seminar
- 15% -- Test2
- 10% -- Class Participation

## COURSE POLICIES

- **Attendance for this course is mandatory. A student absent for more than 3 classes will be dropped from the class.**
- **No laptops or cell phones allowed in the class room**
- I may be covering topics not in the text book. It is at the best interest of students to attend all the classes. It is students responsibility to contact other students for notes/announcements for the missed classes
- We have listed reference books for the course. However lot of subject matter will be covered from the handouts and the research papers.
- ***ABSOLUTELY, NO LATE homework/projects/term paper graded.***
- All homework/projects/term paper and experimental reports be turned in at the START of class on the date due. DO NOT email your homework/project report to me. Where ever applicable, you should submit through “project” option on the server.
- All students will be trusted to pursue their academic careers with honesty and integrity. Academic dishonesty includes, but not limited to, cheating on a test or other course work, plagiarism, unauthorized collaboration with other persons. Students found guilty of dishonesty will be subject to penalties that may include suspension from the university.
- Instructor reserves the right to modify course policies, the course contents and the order in which the topics are covered.
- If a students needs any special accommodations according to the American Disability Act, he or she should let the instructor know.

### **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