

CSCE 4520/5520, Wireless Networks and Protocols

Instructor: Ram Dantu
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Fall '2012
Time: MW (12:30 -1:50 pm)
Meeting Place: NTDP B158

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

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
8. 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:

Topic	Date	Comments (L1 stands for lecture1)
Overview of Wireless Network Operation		<u>courseOverview</u> (L1), <u>Cost Calculation</u> (L2), <u>IPRAN.pdf</u> (L3)
Overview of different technologies and protocols, 2G, 2.5G, 3G, GSM, CDMA, SS7 transport protocols		<u>IS 95 Interface</u> (L4,L5) <u>3GTehnology</u> (L6)
MS-BTS/BSC interfaces and protocol layers (A1-A12 interfaces)		<u>Call Processing</u> (L7,L8)
Connection Management		<u>handoffManagement</u> (L9,L10))
BSC-BSC interface and Radio Resource Mgmt		Interfaces (L11) Radio Resource Management(L12)
MSC-MSC interfaces and protocols		IS41 standard (L13)
Data over wireless networks		<u>cdma data</u> (L14), <u>call flows</u> (L15,L16), <u>mobile ip</u> (L17), <u>tcp perform</u> (L18)
WiFi Protocol		MAC protocol fundamentals(L19), <u>Protocol</u> details (L20,21), <u>QoS</u> (L22)
Seminars by students		LTE (L23), WiFi-Cellular Handoff (L24)
Seminars by students		Mobile TV (L25) Mobile Applications (L26,L27,L28)

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. I may be covering topics not in the book. It is at the best interest of students to attend all the classes. It is student's responsibility to contact other students for notes/announcements for the missed classes
- ***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.

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