

CSE693 & CSE 559 Spring 2007

Advanced Topics In Wireless Networks: Resource Management and Performance Analysis in Wireless Networks

Instructor: Dr. Uthman Baroudi

Lecture: TBA

Location: Bldg. 24-133

Office hours: SSMT: 11:00am – 11:50am

Office-Tel: 4283

E-mail: ubaroudi@ccse.kfupm.edu.sa

Course Objectives:

The advent of wireless and wired networks convergence and as the Internet is increasingly becoming the tool for a wide range of technical, economical and industrial applications, resources management becomes very crucial and vital issue for any future networks. The objectives of this course are to focus on resource management and performance analysis in transporting multimedia traffic in wireless communication networks. Topics include: traffic characteristics, connection admission control, packet scheduling, access control, and mobility and handoff management.

Prerequisite: COE 543 or its equivalent

Course Outline

1. Introduction to Radio Resource Management for Wireless Networks
2. Resource Management for Circuit-Switched Services
3. Traffic Modeling
4. Access Control and Admission Control
5. Mobility Management and Handoff Management
6. MAC and Packet Transmission Scheduling
7. Resource Management in Ad Hoc Networks
8. Applications: Resource Management in Packet Access, CDMA2000 & WCDMA (i.e., UMTS) Systems

Grading policy:

- Assignments 25%
- Midterm Exam 30%
- Project 45%

Textbook:

J. Zander and S.-L. Kim, Radio Resource Management for Wireless Networks, Artech House Publishers, 2001.

References:

2. Recently published articles and papers.
3. S. Kyriazakos and G. Karesos, Practical Radio Resource Management in wireless networks, Artech House Publishers, 2004.
4. T. Janevski, Traffic Analysis and Design of Wireless IP Networks, 2003
5. A. Jamalipour, The Wireless Mobile Internet, Wiley, 2003
6. M. Hassan and R. Jain, High Performance TCP/IP Networking, Prentice Hall, 2004.
7. T. S. Rappaport, Wireless communications, Principles and Practice, 2nd Ed., Prentice Hall, 2002.
8. M. Schwartz, Broadband Integrated Networks, Prentice Hall, 1998.
9. D. Bertsekas and R. Gallager, Data Networks , Prentice Hall, 1992.
10. D. Gross and C. M. Harris, Queueing Theory, 3rd Ed. , John Wiley & Sons, 1998.

Tentative course material breakdown

| Week | Topic | |
|-------------|--|------------------|
| 1 | Introduction to RRM for Wireless Networks | (Chapters 1 & 3) |
| 2 | Wireless link-level & Network-level Performance Analysis | (Chapters 2) |
| 3 | Static Resource Allocation Schemes | (Chapter 4) |
| 4 | Static Resource Allocation Schemes | (Chapter 4) |
| 5 | Handover Resource Management Schemes | (Chapter 5) |
| 6 | Transmitter Power Management Schemes | (Chapter 6) |
| 8 | Continue | (Chapter 6) |
| 9 | Dynamic Resource Allocation Schemes (Chapter 7) | (Chapter 7) |
| 10 | Applications: RRM in CDMA Systems | (Chapters 8 & 9) |
| 11 | Continue | |
| 12 | Continue | |
| 13 | Applications: RRM in packet access systems | (Chapter 10) |
| 14 | Open Research Issues in RRM for Wireless Networks | |
| 15 | Oral Presentations | |