E6951 Wireless and Mobile Networking

Course Requirements

Andrew T. Campbell  
comet.columbia.edu/~campbell  
campbell@comet.columbia.edu

Course Information

- Web page  
  - http://www.columbia.edu/itc/ee/e6950/
- Email List 
  - wireless@comet.columbia.edu
- Lecture  
  - Thursday, 10:30 AM-12.20 PM
- Office hours  
  - Tuesday 4-6 PM
  - Meet groups each week
Course Information

- Grading
  - 30% Homework assignments
  - 20% Midterm
  - 40% Project
  - 10% Online quiz

- TA Contact Details
  - Sanghyo Kim
  - shkim2@comet.columbia.edu
  - http://comet.columbia.edu/~shkim2/
  - Office hours: Monday 4-6 PM
  - Room: Morris A. Schapiro Bldg.

Course Outline

- Introduction
- Fundamentals
  - Radio Channel Model
  - Modulation
  - Fading Mitigation
  - Intersymbol Interference Mitigation
  - Error Control
- Medium Access Control Protocols
  - Centralized Systems
    - CDMA, FDMA, TDMA, Polling
  - Distributed Systems
    - Aloha and Reservation Aloha
    - PRMA, CSMA, RTS-CTS
  - Standards: IEEE 802.11 and ESTI HIPERLAN
Course Outline

• Cellular Networks
  - 2G and 2.5G Systems
    • GSM and GPRS
  - 3G Systems
    • IMT-2000
  - 3G++ Systems
    • 3GIP, 3GPP

• Wireless Internet
  - Mobile IP
  - Wireless TCP
  - Wireless QOS Issues

Course Outline

• 4G Systems: IP-based Mobile Telecommunications
  - Advances in Mobile IP (AAA, etc.)
  - Micro-mobility Protocols
    • Cellular IP (Columbia/Ericsson)
    • Hawaii (Lucent)
  - Services
    • ICEBERG (UCB)

• Pervasive Networking
  - Personal Area Networks
    • Bluetooth and Home RF
  - Ad Hoc Networks
    • Routing: DRS, AODV, PAR (Columbia)
    • QOS: INSIGNIA (Columbia)
  - Sensor Networks
Homework Assignments

- Software programming assignments
  - Network Simulator
  - iLab for internal students
    - http://wormhole.ee.columbia.edu/
    - Setup PC accounts online
    - iLab Access: Name, SN and email
  - external accounts for CVN people
    - TA will setup remote accounts atomically and will email you
- Progressive in nature
  - Tutorial
  - Channel model assignment
  - MAC Protocol assignment (IEEE 802.11)
  - Wireless TCP snoop assignment
- Midterm
  - Mobile IP

Project

- Putting it all together
  - Channel model assignment
  - MAC Protocol assignment (IEEE 802.11)
  - Wireless TCP snoop assignment
  - Mobile IP
- Project
  - Teams of two
  - Common project
  - Subject
    - Cellular IP
  - Deliverables
    - demonstrate working code
    - project paper
Web Quiz

- Final Event
- Online Quiz
- 10 multi-choice questions
- Instant grade