Wireless Internet and Pervasive Computing

(DEN web site: http://www.uscden.net/webapps/login )

Morning Campus Session : M. W. 10:00 -11:15 am, VHE 217
DEN Session : M. W. 12:30 pm – 1:45 pm, OHE 100B
Instructor: Kai Hwang, kaihwang@usc.edu  TA: To be announced
Office Hours: EEB 212, M. W.  2 – 4 pm

Course Description: This course covers design principles and applications of wireless Internet access technologies, pervasive mobile device architecture, and information appliances in Internet and cloud applications. Important topics include 3G/4G cellular radio technologies; WiFi, Bluetooth, GPS, and wireless LAN (IEEE 802.11), Zigbee (IEEE 802.15.4) and mesh networking, mobile devices architecture, OS, and software tools; smart cards, PDA, and e-labels; UPnP and Jini for service discovery in mobile ad hoc networks; Java for mobile computing, mobile IPv6, P2P social networks, Internet of things, and mobility in cloud computing services.

Prerequisite: EE 450 (Computer Networks) or passing the placement test of EE 450.

Course Syllabus: (Lecture Topics, Lecture No. and Dates, contents subject to change)

1. Course Introduction and Internet Evolution (Lectures 1 – 2 on August 23 and 25, 2010)
2. Mobile IPv6 Standards (Lectures 3 on August 30)
3. Mobile pervasive devices (Lectures 4 and 5 on Sept.1 and 8, no class on Labor Day of Sept. 6)
4. Introducing Wifi, WiMax, WLAN, Manet, Sensor, RFID, and GPS (Lectures 6, 7, and 8 on Sept.13, 15, 20)
5. 2G – 3G cellular radio technologies: GSM and CDMA (Lectures 9 and 10 on Sept. 22 and 27)
6. Wireless LAN (IEEE 802.11) and Wireless Meshes (Lectures 11 and 12 on Sept.29 and Oct.4)
7. Specification of Final Project and initial Team Formation (Lecture 13 on October 6)
8. Ad Hoc (Manet), Zigbee (IEEE 802.15.4), and Sensor Networks (Lectures 14, 15 and 16 on Oct. 11, 13 and 18) (Project Proposal due Oct.18)
9. Software, middleware, OS, Jini, UP&P, etc, (Lecture 17 on Oct.20)
11. Global Positioning System (GPS) and Location Sensitive Applications (Lectures 19 and 20 on Oct. 27 and Nov.1)
12. Mid-Term Exam (two-hour exam, Nov. 3, exact time and place to be announced)
13. 4G and Advanced mobile devices (iPhone, etc.) (Lecture 21 on Nov. 8)
14. Internet of Things and Cyber-Physical Systems (Lecture 22 on Nov. 10)
15. Internet Cloud Services (Lectures 23 and 24 on Nov. 15 and 17), Interim Project Reports due Nov. 17
16. P2P Networks and Social Networking (Lectures 25 and 26 on Nov.22 and 24)
17. Future Internet and Pervasive Applications (Lectures 27 and 28 on Nov.29 and Dec.1)
18. Final Project Reports due Dec. 1, 2010 (in substitution of the written final exam)


Grading Policy and Class Procedures:

1. Visit the EE 532 DEN class web site frequently for announcement, handout material, and records.
2. Check with the TA first for all questions on tests and projects before discussing with the instructor
3. Mid-term written exam scheduled for Nov. 3, 50% for all students (no makeup exam, if missed)
4. Two pop quizzes for campus students only: 10%. No pop quizzes given to off-campus DEN students.
5. Final project by Teams of 3 campus students each, Off-campus DEN students work on Project individually.
6. Project Team proposal due Oct. 18, Interim Report due Nov.17 counting 10% for campus students and 15% for remote DEN students (could be modified from the proposal).
7. Final Project Report due Dec.1 counts 30% for campus students and 35% for remote DEN students
8. Cheating caught in all exams gets zero scores and plagiarism detected in final project will fail the course.