

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. Wireless LAN (IEEE 802.11) and Wireless Meshes *Lecture 14* on **Oct. 11**)
9. Ad Hoc (Manet) and Sensor Networks (*Lectures 15 and 16* on **Oct.13 and 18**) (*Project Proposal due Oct.18*)
10. Software, middleware, OS, Jini, UPnP, etc, (*Lecture 17* on **Oct.20**)
11. Bluetooth Technology (*Lecture 18* on **Oct. 25**) (*Project Proposal* approved by **Oct.25**)
12. Zigbee, GPS, and Location Sensitive Applications (*Lectures 19 and 20* on **Oct. 27 and Nov.1**)
13. *Mid-Term Exam* (two-hour exam, **Nov. 3**, exact time and place to be announced)
14. 4G and Advanced mobile devices (iPhone, etc.) (*Lecture 21* on **Nov. 8**)
15. Internet of Things and Cyber-Physical Systems (*Lecture 22* on **Nov. 10**)
16. Internet Cloud Services (*Lectures 23 and 24* on **Nov. 15 and 17**), *Interim Project Reports* due **Nov. 17**
17. P2P Networks and Social Networking (*Lectures 25 and 26* on **Nov.22 and 24**)
18. Future Internet and Pervasive Applications (*Lectures 27 and 28* on **Nov.29 and Dec.1**)
19. *Final Project Reports due Dec. 1, 2010* (in substitution of the written final exam)

Required Textbook: *Pervasive Computing* (ISBN: 3-540-00218-9), Second Edition, by Hansmann, et al, Springer-Verlag, 2003.

Optional Reference Book : Stefan Poslad : *Ubiquitous Computing: Smart Devices, Environments and Interactions*, Wiley Publisher; 2009. (ISBN-10: 0470035603).

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.10**: 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.