

University of Southern California, EE 532 Summer 2016

(This Summer Course 2016 runs 7 weeks from May 18 to July 6, webcast through the DEN)

Wireless Internet and Pervasive Computing

DEN web site: <http://courses.uscden.net> (Do not use the USC Blackboard)

Class Code: 30554 R for campus students, 30556D for DEN remote students

M. W. 9:00 am - 11: 50 am, Classroom: OHE 100B (DEN Studio)

Prof. Kai Hwang, kaihwang@usc.edu, Office Hours: EEB 212, M. W. 1:00 – 3:00 pm

Course Description: This course covers wireless Internet access technologies, pervasive mobile device architecture, Internet of Things and mobile cloud applications. Important topics include smart phones and tablet computers, sensors, RFID and GPS technologies, 3G/4G/5G cellular radio-access networks, WiFi meshes, Zigbee, mobile OS (Android and iOS), software tools for resource discovery, location-sensitive applications, IoT sensing, big-data analytics, and mobile cloud computing.

Prerequisite: EE 450 or equivalent course or background approved by the instructor.

Course Syllabus: (11 lectures plus two exams scheduled from June 18 to July 6, 2016)

1. Internet Evolution and Wireless Technologies (Lecture 1 on May 18, 2016)
2. The Internet of Things (Lecture 2 on May 23), (Chap.9 of Text and handout paper)
3. 2G/3G/4G cellular mobile networks (GSM, CDMA, WCDMA, LTE) (Lecture 3 on May 25)
4. WiFi, WiMax, and Mobile Devices (Lecture 4 on June 1)
5. Cloud Models and Services (Lecture 5 on June 6) (Chap.4 of Hwang Text)
6. **Mid-Term Exam on June 8, 2015** from 9:30 – 11:30 am in Studio 100B, covering first 5 lectures.
7. Smart Phones and MIMO Antennas (Lecture 6 on June 13)
8. Tablet Computers : Hardware and Architecture (Lecture 7 on June 15)
9. Mobile OS (Android, iOS) and Apps. (Lecture 8 on June 20)
10. Cloud-based Radio Access Network (C-RAN for 5G) (Lecture 9 on June 22)
11. Advanced IoT Sensing and Mobile Cloud Applications (Lecture 10 on June 27)
12. Big Data Science and Machine Intelligence (Lecture 11 on June 29)
13. **Final Exam on July 6** covering all 11 Lectures (Time and place yet to be announced)

Reference Books (Additional Reference Papers will be available from class web site)

1. U. Hanmann, et al, *Pervasive Computing: The Mobile World*, Springer 2013. (second edition)
2. K. Hwang, et al, *Distributed and Cloud Computing*, Kaufmann, 2012 (A few updated Chapters for the second edition will be handed out in class lectures, if the class is small)

Grading Policy and Class Procedures:

1. This DEN course runs for 7 weeks in Summer 2016. Visit Viterbi DEN Web site: courses.uscden.net frequently for course handout and announcement and course handout. No class on May 30 and July 4.
2. Each lecture is divided into two halves with 10 minutes break in between. The first half runs 9:00 ~ 10:20 am and the second half 10:30 ~ 11:50 am.
3. The **Mid-term Exam (June 8) is weighted 40%** and **Final exam (July 6) 60%**. All exams will be close-note and close-book. No makeup exam will be given, if you miss any of the two scheduled exams.
4. All campus and local DEN students must take the exams on campus. Remote DEN (outside of greater LA areas) students must seek for approval to take the exams at remote sites under special arrangement.