

EE 542 : Internet and Cloud Computing, Fall 2014 (updated Sept.8, 2014)

Class Website: <http://www.uscdcn.net/webapps/login> for all sections, no access thru USC blackboard

DEN Studio Section 30535D and DEN 30537: 12:30 – 1:50 pm, M.W. OHE 100 D

Sec.30533D : 2:00 – 3:20 pm, M.W. VPD 106, Sec. 30413D : 1:00 – 3:50 pm, Friday, KAP 158

Instructor : Kai Hwang, Professor of Electrical Engineering and Computer Science

Office Hours: M.W.F. 9 – 11 am, EEB 212, Contact: kaihwang@usc.edu, Tel.: 213-740-4470 (Office)

TA: Yue Shi, Office Hours: Tu. 2 – 4:30 pm, Wed. 10-11:30 am, EEB 110. Email: yueshi@usc.edu

Mentor: S. Abhilash, Office Hours: Th.10-12 am, Fri. 11am – 1 pm, EEB 110, Email: sabhilas@usc.edu

Catalogue Description: Principles and technologies of server clusters, virtualized datacenters, Grids/P2P, Internet clouds, social networks, Internet of Things (IoT), and applications

Prerequisite: EE 457 or EE 450 recommended preparation, or consent from the instructor.

Textbook: K. Hwang, G. Fox and J. Dongarra, **Distributed and Cloud Computing: From Parallel Processing to the Internet of Things**, Elsevier, 2012. (ISBN 978-0-12-385880-1)

Course Contents and Objectives:

This course is designed for graduate students in electrical engineering and computer science. Students will learn the theory, architecture, hardware/software, and programming of computing clouds and other network-based computing systems. Both M.S. and Ph.D. students can benefit from the course. Students will have the opportunity to gain hands-on experience on Amazon cloud (AWS) or on any public cloud. Case studies include applications such as Amazon EC2 and S3, Google AppEngine, Salesforce, Facebook, Dropbox, iCloud, MapReduce, Hadoop, VMWare Tools, etc.

Syllabus and Weekly Lecture Contents: (Lecture ordering subject to change, check with the latest online version posted frequently. Friday students follow Friday schedule except mid-term and final exam)

Lectures (Red for Friday)	Topics Covered, Book Chapter and Special Events (due dates and exams)
Lec.1 / 2, Aug.25, 27, 29	Internet Technology, Distributed Systems, and Big-Data , Chap.1
Lec. 3 / 4, Sept.3, 5, 8	Cluster Infrastructure and Middleware, Chap.2, (Sept.1, no class)
Lec. 5 / 6, Sept.10,12,15	Cloud and Project Spec., Chap.4, HW #1 due Sept.12 for Fri. and 15 for MW Secs.
Lec. 7 / 8, Sept.17,19, 22	Public Clouds and Infrastructures, Chapters 4 and 6
Lec. 9/10, Sept. 24, 26, 29	MapReduce and Hadoop Computing, Chap.6, Quiz#1 for Lectures 1 ~ 8
Lec.11/12, Oct. 1, 3, 6	Cloud Benchmark Evaluation, (Handout paper), Proposal due Oct.1, 3
Lec.13/14, Oct. 8, 10, 13	New Apps on AWS, HW #2 due Oct.10 for Friday and Oct.13 for MW sections
Lec.15, Oct.15,17 (1-2:20 pm)	Cloud OS and Software Support, Proposal reviews with TA and Mentor
Oct.20, 2014 (Monday)	Mid-Term Exam, 1 ~ 3 pm, place TBA, covering Lectures 1-15 for all students
Lec.16/17, Oct. 22, 24, 27	Virtual Machines and Virtualization Processes, Chap.3 (Part1)
Lec.18/19, Oct.29, 31, Nov.3	Hypervisors and Virtual Clustering, Chap.3, (Part 2)
Lec.20 / 21, Nov. 5, 7, 10,	Grids, Chap.7 and P2P Networks, Chap.8, Interim Reports reviews
Lec.22 / 23, Nov.12, 14, 17	P2P Networks, Chap.8 and Cloud Mashups, Chap.9, Quiz#2 for Lectures 16 ~ 21
Lec.24 / 25, Nov.19, 21, 24	Sensors/GPS and IoT, Chap.9, HW #3 due Nov.19, 21, Final Report due Nov.24
Nov.26 - 29, 2014	Thanksgiving Holiday, no class, only one-week from the Final exam.
Lec.26 / 27, Dec.1, 3	Big Data and Future Internet (MW classes for all students, no Friday class)
Dec. 5, 2014 (Friday)	Final Exam: 1 – 3 pm, place to be posted, covering Lectures 5 ~ 27 for all students

Grading Policy and Class Rules: The course work is evaluated with 5 performance metrics in 15 weeks:

- **Homework Sets (15 %):** 3 Homework Sets to be done individually. Each HW set takes at least 10 hours Some may take 30 hours. Get started immediately with readings and investigated solutions.
- **Two Quizzes (10%):** Covering all previous lectures or beyond the last exam, (about 40 minutes each)
- **Mid-Term Exam (25 %):** Oct.20, 2014 (Time/place to be announced), covering up to Lecture 15.
- **Term Project (20%):** Team effort on cloud experiments with a team report due **Nov.24, 2014**
- **Final Exam (30%):** Dec.5, 2014, exact time /place yet to be announced for all students. This is a comprehensive exam for 2 hours covering Lectures 5 ~ 27 and the AWS project.

Note: No late homework or project report will be accepted. Term Projects are done in teams of 4 students each. Team members can be formed across the sections. All quizzes and exams are closed-book/notes. Students in all 3 sections take Mid-term and Final exams at the same time. No make-up exam or quiz will be given to any student, if you miss the exam or quiz in the announced schedule.