

Fall 2012 Course Offering, EE 657, Class No. 30431 (Sept.5, 2012)

Parallel and Distributed Computing

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Class Time: MW 10:40 am - 11:55 am, Class Room: KAP 138

Course Description:

This course covers the systems architecture and enabling technologies of parallel and distributed computing systems and their innovative applications. We cover scalable multiprocessor systems, clusters of computers, P2P networks, computational Grids, virtual machines, virtual clusters, Internet Clouds, Internet of Things (IoT) and social networks. Case studies include Sequoia, Tianhe-1A, TeraGrids, XEN, Google AppEngine, Amazon EC2 and S3, NASA and CERN clouds, BitTorrent, Facebook, Twitter, MapReduce, Hadoop, VMWare Tools, and some cloud and IoT projects, etc. The course acquaints M.S. and Ph.D. students in computer science, electrical and computer engineering with Top-500 superclusters and various parallel and distributed computing systems for supercomputing, e-commerce, utility computing, cloud services, social networking, and emerging Internet applications.

Teaching Schedule, HW, Exam and Report Dates:

Lecture Date	Topics, Assignments and Events	Coverage
Aug. 27, 29	Distributed Systems and Cloud Technologies	Chapter1
Sept. 5, 10	Server Clusters and Supercomputers,	Chapter 2
Sept. 12, 17, 19	Virtual Clusters and Virtualization, HW#1 due Sept.17	Chapter3
Sept.24, 2012	Project Specification	
Sept.26, Oct.1, 3	Cloud Platforms and Cloud OS HW#2 due Oct.1	Chapters 4 and 6
Oct.8, 10, 15	MapReduce and Cloud Programming	Chapter 6
Oct. 17, 22	Cloud Ecosystem and Security Support HW#3 due Oct.22	Chapter 4
Oct. 24, 29, 31	Grids and P2P Computing Systems	Chapters 7 and 8
Nov.5, 7	Internet of Things and Social Networks, HW#4 due Nov.5	Chapter 9
Nov.12, 2012	Mid-Term Exam	
Nov.14, 19	Future Internet and Cloud/IoT Applications	Chapter9, new
Nov.28, Dec.3	Final Project : Presentations and feedbacks	In class room
Dec.5, 2012	Final Project Report due on-line	Before noon time

Prerequisite: EE 457 or passing the placement test on EE 457 at USC. Those who had EE 557 can automatically take EE 657, since EE 457 is the prerequisite of EE 557. The two courses EE 657 and EE557 can be taken, concurrently, since they are complementary in contents. Computer science students who had equivalent EE 457 or 557 background are welcome to take this course. Recommended preparation: undergraduate background in computer networks such as EE 450, but this is not a prerequisite.

Textbook: K. Hwang, G. Fox and J. Dongarra, *Distributed and Cloud Computing: From Parallel Processing to The Internet of Things*, Morgan Kaufmann Publishers, 2012. ISBN 978-0-12-385880-1. The book is available at USC Bookstore, or order directly from Amazon, or from the Morgan Kaufmann Publisher (www.mkp.com).

Grading Policy and Class Procedure:

- The course work will be evaluated with three parts :
 - Homework Problems (20%):** 4 HW Sets (No late HW will be accepted after due day)
 - Mid-Term Exam (45%) :** Open-book Exam (No make-up exam will be given)
 - Term Project : PPT Presentation (10%) and written Report (25%)** (substituting the final exam)
- The final term project is done individually for such a small class. Sample term projects in the past include CPU/GPU clusters, virtual clusters, virtual machine architecture, P2P networks, cloud platforms, datacenter architecture, Internet of Things, cloud programming experiments on AWS, innovative applications in the cloud, IoT and social networks, etc. All project topics must be approved by Prof. Hwang before starting the effort.
- Class Web Site : <http://blackboard.usc.edu> (clip under EE 657, login with USC user account). Always contact Prof. Kai Hwang by Email first: kaihwang@usc.edu. He will answer you on the same day, or he will call you back if you leave your contact phone number in the Email. His Office Hours are **M.W. 1 - 3 pm** at **EEB Rm 212**. His office phone is **213 740 4470**. Appointment is needed if you want to meet in any other time.