

EE 542 : Internet and Cloud Computing, Fall 2017 (updated Aug.22)

Class Website: <http://blackboard.usc.edu>

Sec. 30533R : MW 2 – 3:15 pm, Class Room: WPH B27 (Rossier School of Education)

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

Office Hours: M.W. 9 am to 12 am, Office EEB 212, Email: kaihwang@usc.edu,

TA: Yue Shi, yueshi@usc.edu, Office Hours, W. 4-6 pm and F. 10 am–12 noon in SAL Open Lab.

Course Description:

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, Internet of Things (IoT). machine learning, big data analytics, cognitive computing, and brain-inspired future computers.. Students will have the opportunity to gain hands-on experience in using Amazon cloud (AWS), where real-life cloud, big data or IoT applications will be developed and executed on Amazon EC2 and S3, etc. We will cover various clouds, namely AWS, GAE, Salesforce, Azure, Hadoop, Spark, Eucalyptus, vSphere, XEN, Docker containers, VMWare Tools, etc. .

Recommended Background: (Not prerequisite) EE 457 or EE 450 recommended or consent by instructor.

Required Textbook: K. Hwang : *Cloud Computing for Machine Learning and Cognitive Applications*, MIT Press, (2017). ISBN: 978-0-262-03641-2. Available USC Bookstore or order from mitpress.mit.edu, or www.amazon.com

Syllabus and Weekly Lecture Contents: (updated August 22, 2017)

Lectures and Dates in 2017	Topics Covered, Source, Due Dates and Exams
Lectures 1, 2 , Aug. 21, 23	Course Introduction, Principles of Cloud Computing Chapter 1
Lectures 3, 4, Aug. 28, 30,	Cloud Architecture, and Service Models, Chapter 4
Lectures 5, 6, Sept. 6, 11	Virtual Machines, Containers, Chapter 3 (No class on Labor Day , Sept.4)
Lectures 7, 8, Sept. 13, 18	MapReduce, Hadoop and Spark Programming, Chapter 8, HW#1 due Sept. 13
Lecture 9, Sept. 20, 2017	Cloud Project Specification, (Team Proposal due Sept.25)
Lectures 10, 11, Sept. 25, 27	Big Data, IoT and Cognitive Computing, Chapter 2, ,
Lectures 12, 13, Oct. 2, 4,	Mobile Clouds, Cloud Mashup and Cloud OS, Chapters 3 and 5 ,
Lectures 14, 15, Oct. 9, 11	Cloud Performance and Scaling Techniques, Chapter 10, HW#2 due Oct. 9
Lecture 16, Oct. 16, 2017	Review Session of the first 15 lectures, Chapters 1 ~ 5, 8 , 10
Mid-Term Exam, Oct. 18	2 pm to 3:20 pm (80 minutes), Class Room WPH B27 plus overflow room
Lectures.17, 18, Oct. 23, 25	Machine Learning Algorithms Chapter 6
Lectures 19, 20 , Oct.30, Nov.1	AI Machines, and Deep Learning Tools Chapter 7
Lectures 21, 22, Nov. 6, 8	TensorFlow and Cognitive Systems, Chapter 9, HW#3 due Nov.13.
Lectures 23, 24, Nov.13, 15	Social Media, Health-Care Apps, and Security Issues, Chapters 8, 9, 10
Lecture 25 , Nov. 20, 2017	SMACT Technologies and Brain-inspired Future Computers, Chapters 1, 2, 7 Project Report due Nov. 20, (No class on Nov.22, Thanksgiving)
Lecture 26, Nov.27, 2017	Review of the entire course and return of graded Project Reports
Final Exam, Nov. 29	2 – 4 pm, Exam Rooms to be announced, covering the entire course .

Grading Policy and Class Rules:

- All exams are close-book/close-notes without make-up exams. Go to the TA /mentor for all questions related to **homework, project, and grading problems.** Dr. Hwang handles only questions related to **lecture/book material.**
- **Homework Sets (18 %):** Submit hardcopy homework (preferred typed in Word) at the beginning of class on due days in **Sept.13, Oct.9, and Nov.13.** No late homework will be accepted, because of handout solutions.
- **Mid-Term Exam (28 %):** **2 pm – 3:20 pm, Oct.18, 2017,** covering the first 15 lectures & HW#1 and #2
- **Cloud Programming Project (16 %):** AWS cloud experiments with Project Reports due **Nov. 20, 2017.** Term Projects are done by teams of 3 students each. Submit one hardcopy Project Report per team. .
- **Final Exam (38 %):** **Two hours (2 – 4 pm), Nov.29, 2017 ,** time and exam room yet to be announced, covering all Lectures, 10 chapters, AWS Project, and 3 HW sets.