CS491/591: Principles of Virtualization & Cloud Computing (Spring 2015)

Website: http://www.cs.siu.edu/~dche/courses/CS425/

Class time: 3-3:50 pm Venue: Faner 1224

INSTRUCTOR

Dr. Dunren “Daren” Che
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TA

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Why Cloud Computing?

Since the last couple of years, Cloud Computing has become the new central point of research in academia and the IT industry. Cloud Computing holds tremendous potentials for organizations of all shapes and sizes, and for users from all walks. It is becoming an indispensable element (a computing facility as service) for every business and the life of every individual.

Course Description

Cloud Computing (CC) represents a recent major strategic shift in computing and Information Technology. This course explores fundamental principles, foundational technologies, architecture, design, and business values of CC. Understanding will be reinforced through multiple angles including: analysis of real world case studies, hands-on projects and in-depth study of research developments.

Pedagogical Approach
The course first warms up the students with a general introduction (review) of distributed computing, which CC had its “theoretical origin” from. The course then provides a series of comprehensive lectures on the foundational knowledge of Cloud Computing, foundational technologies, architecture, design, and business values. Students will be given the opportunity to explore Cloud Computing concepts from multiple angles; core concepts will be reinforced through analysis of real world case studies and group discussions. Undergraduate attendees will be guided to study popular cloud systems/products, and graduate attendees will be encouraged (partially required) to read recent research papers and make presentations (seminars).

**Semester Hours:** 40

**Prerequisite:** CS330 (or graduate standing)

**Topics**
- Introduction to the course ---------------------------------------- 1 lecture
- Introduction to Distributed Computing----------------------------- 2 lecture
- Introduction to Cloud Computing ------------------------------- 2 lectures
- Virtualization technology --------------------------------------- 5 lectures
- Architectures and models of Cloud Computing ------------------- 8 lectures
- Service Oriented Architecture (SOA) ----------------------------- 4 lectures
- Cloud operating systems ---------------------------------------- 5 lectures
- Cloud programming models and frameworks ----------------------- 6 lectures
- Cloud data storage and management ----------------------------- 3 lectures
- Cloud security -------------------------------------------------- 2 lectures
- Mobile Cloud Computing ---------------------------------------- 2 lectures

**Books**

(1) **Distributed and Cloud Computing, 1st Edition (required)**
From Parallel Processing to the Internet of Things
Author(S): Hwang & Dongarra & Fox
Published: 17 Oct 2011
Imprint: Morgan Kaufmann
ISBN: 9780123858801
[https://www.elsevier.com/books/distributed-and-cloud-computing/hwang/978-0-12-385880-1](https://www.elsevier.com/books/distributed-and-cloud-computing/hwang/978-0-12-385880-1)

(2) **Cloud computing (recommended general reading)**
Author(s): Dr. Kris Jamsa, MBA, PhD
ISBN-10: 1449647391
Grading and policy

Students’ final grades will be decided based on three aspects of performance: two term exams and a series of assignments/projects. Graduate students (who registered for CS591) will be additionally required to write a research report (on a jointly decided topic with the professor) and make presentations (The report can be either more research oriented or study oriented, of which the former requires you to propose original ideas/approaches/methods/algorithms, while the latter requires you to spend relatively more time on reading literatures and write a short survey).

Instead of writing a research report, CS591 students can choose to do a hands-on project individually or jointly proposed and approved by the instructor.

The weights deciding your final grade will be evenly distributed among the 3 (4 for CS591) aspects of performance.

A “nasty” but important issue – dishonesty and cheating

- Any intended dishonest and cheating behavior will be punished according to department and university policy, which usually result in failure of the entire course
- Innocent (unaware) practice of cheating shall be prevented.
- Do your assignments independently if pair or group collaboration is not explicitly suggested by the instructor
- At exams, do not peep into the work of others sitting around you
- When it comes to research report, it is pitfalls are even more hidden:
  - The more sources (papers and websites, etc.) you explore and take materials from, the less chance you are considered of plagiarism
  - Simple “copy and paste” is risky
  - Digest the techniques and restate using you own language (imagining cooking as a metaphor)
Point to the source publication if you address a major issue or idea that is not originated from your own head (a counterexample: former SIU present, Glenn Potshard’s dissertation)