Advanced Topics in Distributed Systems

This course aims to cover research topics on distributed systems. Topics including distributed time and global states, distributed coordination and consensus, P2P systems, distributed transactions and concurrency control, distributed replications and synchronization. Case studies about latest distributed systems such as Chord, Paxos and Spanner and research papers from top conferences will be discussed.

Advisory: Students are expected to have solid foundations on operating systems and database systems.

Grade Descriptor:

A

EXCELLENT - exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

B

GOOD - good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

C

FAIR - adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the
ability to solve simple problems.

D

MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

Equivalent Offering:
Units: 3 (Min) / 3 (Max) / 3 (Acad Progress)
Grading Basis: Graded
Repeat for Credit: N
Multiple Enroll: N
Course Attributes: MSc Computer Science
MProl-PhD Computer Sci & Erg

Topics:

COURSE OUTCOMES
Learning Outcomes:

At the end of the course of studies, students will have acquired the ability to
1. Understand what kinds of distributed systems out there and their differences.
2. Understand the technology behind distributed systems, such as distributed consensus and gossip protocol.
3. Understand the applications of distributed systems in different domains.

Course Syllabus:

This course aims to cover research topics on distributed systems. Topics including distributed time and global states, distributed coordination and consensus, P2P systems, distributed transactions and concurrency control, distributed replications and synchronization. Case studies about latest distributed systems such as Chord, Paxos and Spanner and research papers from top conferences will be discussed.

Assessment Type:

- Essay test or exam: 50%
- Homework or assignment: 50%

Feedback for Evaluation:

1. Quiz and examinations
2. Course evaluation and questionnaire
3. Question-and-answer sessions during class
4. Student consultation during office hours or online

Required Readings:

3. Distributed Systems Reading List: https://dancres.github.io/Pages/

Recommended Readings:

1. CSCI5600
   - Acad Organization=CSEGV; Acad Career=RPG

  OFFERINGS

  LEC : Size=30; Final Exam=Y; Contact=3

  COMPONENTS

  ENROLMENT REQUIREMENTS

  1. CSCI5600
   - Enrollment Requirement Group:
     - For students in MSc Computer Science or MPhil - PhD Computer Science & Engineering or UG Computer Science or UG Computer Engineering;
     - Pre-requisites: CSCI3150 & CSCI3170 (for UG students only);
Exclusion: CMSC5735

New Enrollment Requirement(s):
Exclusion = Not for students who have taken CMSC 5735 (Advanced Topics in Cloud Computing)

CAF

<END OF REPORT>