

ECE7610/ECE7650/CSC7220: Advanced Parallel and Distributed Systems Winter 2008, Credit Hrs: 4

Instructor: Cheng-Zhong Xu
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Office Hour: Monday 1:30-3:30pm or by appointment

Class Meeting Place: 2409 Engineering Building

Class Meeting Time: 5:30-7:20pm Mon/Wed

Course Description

In the past decade we have witnessed the explosive growth of network-centric distributed applications, ranging from web-based information sharing and dissemination to high-performance distributed computing on the Internet. This course is designed to provide graduate students in computer science and engineering with deep insights into key enabling technologies of advanced distributed and parallel applications.

The objectives of this course are

- Develop in-depth knowledge about networking, distributed and parallel computing from architecture, operating systems, middleware, to algorithms
- Obtain hands-on experience in designing and implementing advanced distributed and parallel systems on the Internet
- Trained in advanced distributed programming

Tentative Topics:

- Client/Server Programming and Java RMI
- One-way Communication in Message Queues
- Multi-core, SMP, and Cluster Architecture
- Multithreading and Multithreaded Servers
- Server Load Balancing
- Server Virtualization
- Thread/Process Scheduling
- Mobility and Migration
- Datacenter and Cloud Computing
- Autonomic Management
- Security in Distributed Systems
- Synchronization
- Replication and consistency

Advanced Java programming and agent-oriented programming will also be covered in the class.

Upon completion of this course, you are expected to be able to design and implement parallel and distributed approaches for various scientific, engineering, and e-commerce applications.

Course Format:

This course covers advanced topics in parallel and distributed systems with a little research aor to it. The course material will be from the references

- Coulouris, Dollimore, and Kindberg, Distributed Systems: Concepts and Design, 4th Edition, Addison-Wesley, 2005.
- A. Tanenbaum and M. van Steen, Distributed Systems: Principles and Paradigms, Prencice-Hall, 2002, ISBN 0-13-088893-1.
- C. Xu, Scalable and Secure Internet Services and Architecture, Chapman&Hall/CRC, 2005

The reference book will be complemented with a number of recent conference and journal papers. The course material, including Lecture Notes, Problem Sets and Reading Papers, will be available on the site http://www.ece.eng.wayne.edu/_czxu/ece7610.html

Prerequisites:

It is assumed that you are familiar with the fundamentals of parallel and distributed systems and have basic parallel and distributed programming skills, as covered in its prerequisite ECE5610, ECE5650, or equivalent course. If you feel that your background lacks in some of these, please review the material of relevant courses and come to see Dr. Xu.

Course Requirements

Students are required to attend all lectures and participate in class discussion, understand and critique papers in the reading list, conduct programming labs, and take one exam. In addition, students are expected to carry out a semester-long project.

The goal of the term project is to develop deep understanding of the technologies learned in class, accumulate hands-on experience in the application of the technologies to solve real-life problems, and possibly advance the state of the art in the field through your own research. You are expected to complete a term project in line with this objective, submit written report, and make an oral presentation or demonstration. The projects should be conducted individually or in a small group of up to 2 members.

Grading:

Final grades will be determined by the following factors:

- Class participation: 10 %
- Paper presentation: 5%
- Paper critiques: 10%
- Programming labs: 10%
- Examination: 25%
- Term project: 40%.

Grading scale: A: 90~100; A-:85~89; B+80~84; B:75~79; B-:70~74; C+:65~69; C:60~64

Cheating Policy and Penalty for Cheating:

Cheating is defined by the University as “intentionally using or attempting to use, or intentionally providing or attempting to provide, unauthorized materials, information, or assistance in any academic exercise.” This includes any group efforts on assignments or exams unless specifically approved by the professor for that assignment/exam. Evidence of fabrication or plagiarism, as defined by the University in its brochure Academic Integrity, will also result in downgrading for the course. Students who cheat on any assignment or during any examination will be assigned a failing grade for the course. Any work submitted for a grade must include the following statement and be signed and dated. If this is missing or not signed and dated, the work will be returned ungraded.

I have neither given nor received unauthorized assistance on this work.

Signed:

Date:

Drop Policy:

The last day to drop any class with a tuition refund is the end of the second week of classes. Any withdraw afterwards will be assigned “withdrawal passing (WP)” or “withdrawal failing (WP)” on the transcript. No class drop will be granted after the 3rd week.

Policy on Deferred Grades:

A grade of “I” can only be assigned if all of the following criteria are met:

1. You are not currently failing the class and,
2. There is not a substantial quantity of work yet to be completed,
3. There is no extra work required of the instructor beyond the normal duties of grading the paper/exam,
4. There is no need for you to attend the class in subsequent terms.

The final decision to assign an incomplete grade rests with the instructor. An “I” grade must be made up within one year of assignment of the grade.