ECE 428/CS 425/CSE 424 Distributed Systems
University of Illinois at Urbana-Champaign
Spring 2008

Prerequisites: CS 423 (Operating Systems) or equivalent course (approval of instructor required for latter).

Credits: 3 hours

Textbook: G. Coulouris, J. Dollimore, and T. Kindberg. **Distributed Systems: Concepts and Design**. Addison-Wesley, 4th edition, 2005. You can mostly limp through with the third edition, but the fourth is official for this class.

Some other relevant books are listed at the end of this handout. We may also use some material from papers from journals and conferences. You will be provided information on these at a later time.

Course Staff:
Instructor: Yih-Chun Hu
Phone: 333-4220
NetID: yihchun
Office: 464 Coordinated Science Lab
Office Hours: Tuesday 2:00-3:00pm

Teaching assistants: Jason Haas   and   Jerry Chiang
Phone: 244-5225   (same)
NetIDs: jjhaas2   chiang2
Office: 443 Coordinated Science Lab
Office Hours: Monday 3:00-4:00pm
                      Wednesday 4:00-5:00pm

Course Website: http://www.crhc.uiuc.edu/~yihchun/428/

Watch the website for course-related announcements.

Course newsgroup: There isn't (an official) one. Please use the Google group. You may request an account through the link on the web page, or by directly visiting http://groups.google.com/group/ece-428-spring-2008

Course Overview
This course focuses on basic concepts underlying the design, implementation, and management of distributed systems. It covers fundamental topics such as basic concepts in distributed systems, synchronization, election, distributed agreement, inter-process communication and coordination, replicated data management, distributed objects, security, and directory and discovery services. This course does not deal with the details of computer networking (e.g., details of different routing

protocols in the Internet), except as applied to topics listed above. Students interested in the latter topics are recommended to take ECE/CS 438.

Assignments:
1. Homework sets will be distributed on an approximately bi-weekly basis. Homeworks will be due ***by the beginning of class*** on the due date. They must be submitted in person, or through alternative arrangements with Jerry Chiang.

2. Up to 5 programming assignments will be given throughout the semester, each requiring 2-4 weeks of effort. You may choose to work in groups of up to 2 students for each of the programming assignments. You may change groupings from one programming assignment to the next, though we do not suggest you do so. Programming assignments must be submitted by uploading .zip files in chunks not to exceed 8 MB.

Tentative Grading:
• Class Participation 5%
• Homework sets 15%
• Programming Assignments 30%
• Mid-term Exam 20%
• Final Exam 30%

Lecture Participation:
Attending the lectures is important. To facilitate better understanding of the material, you are expected to read the relevant chapters from the textbook prior to class.

Course Schedule (tentative)
Lectures: The plan is to cover the following broad topics - new topics might be added. Readings will be specified as and where needed. The order of topics, as well as time estimates, are tentative and subject to change.

Topic	Number of Lectures
Introduction	1
Basic Theoretical Concepts – I	7
Peer-to-peer computing	2
The Internet	3
(Midterm)	1
Basic Theoretical Concepts – II	2
Transactions & Concurrency	4
Replication	3
Distributed Shared Memory	1
Distributed File Systems	1
Security	1
Miscellaneous	1

Programming Projects
We will build a peer to peer system in several stages (up to 5 programming assignments).

Course Policies:

Policy on Attribution: It is the course policy that all of the work you submit for grading, or in support of graded material, as an individual or project group, shall either be your own thought product or clearly and specifically credited to the proper source. In other words you must clearly and visibly provide proper attribution for ideas and expressions that you borrow from others. This includes the textbook, classmates, and Internet sources. We might choose to give you less than full credit for a submission that is not wholly yours. Violations of this policy will be treated seriously. The maximum penalty at the course level is a final grade of "F", with no permission to drop (other penalties might be imposed by the University). In short, we recommend that you not violate this policy.

Books and Notes on Exams: I have traditionally given open-book and open-note exams. Whether or not this will continue depends on feedback from the class. If books and notes are permitted, any books or notes you wish to use during the exam must be brought prior to starting the exam. You may not borrow notes or books from the instructor, the proctor, or other students during the course of the exam, nor may you print out additional notes during the course of the exam.

Other Outside Assistance on Exams: During exams you must not collaborate, cooperate, network, or otherwise exchange information with, receive information from, or provide information to, any third party other than a test proctor. The use of electronic devices may also be regulated.

Policy on Late Submission: Unless otherwise specified, all programming assignments, or components thereof, that are to be electronically submitted are due by 11:59 p.m. Central Time on the due date. Similarly, homeworks, or components thereof, that must be submitted by other means are due at the beginning of class on the due date. Late homework submissions will be accepted only under extenuating circumstances, and might need approval from the Dean's office.

Homework submissions that are more than one class period late will not be accepted for grading. Homeworks that are between one minute and one class period late may not receive full credit. **Programming assignments** are due, uploaded to the server, at 11:59pm Central Time on the day of the deadline. However, late programming assignments are given a grace period of 48 hours without any penalty, except
(a) Due to time constraints, the grace period may not apply to the last programming assignment, **and**
(b) There will be no extension of these 48 hours for any reason, including but not limited to any weekends, holidays, computer failures, network failures, severe weather events, or other acts of god.
After the expiration of the deadline (and any applicable grace period), the penalty will not exceed (and is unlikely to be less than) 1% of the assignment's grade *per hour or portion thereof*. This penalty is applied as a deduction, not a scaling.

Some Relevant Books

1. "Distributed systems: principles and paradigms", A. Tanenbaum and M. Steen, Prentice Hall.
2. "Distributed algorithms: concepts and design", N. Lynch, Morgan-Kaufmann.
3. "Distributed computing: fundamentals, simulations and advanced topics", H. Attiya and J. Welch, McGraw Hill.
4. "Unix network programming", W. R. Stevens.
5. "An engineering approach to computer networking", S. Keshav, Addison-Wesley.
6. "Computer networks", A. Tanenbaum, Prentice-Hall.
7. "Applied operating systems concepts", Silberschatz, Galvin and Gagne, Wiley.