

ECE 428/CS 425/CSE 424 Distributed Systems, Fall 2005
University of Illinois at Urbana-Champaign

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

Credits: 3 hours

Textbook: Coulouris, G., Dollimore, J., and Kindberg, T., *Distributed Systems: Concepts and Design*, Pearson Education/Addison-Wesley, 4th edition (3rd edition will suffice for the most part).

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: Nitin H. Vaidya, Phone: 265-5414 E-mail: nhv@uiuc.edu
Office: room 458 Coordinated Science Lab.
- Prof. Yih-Chun Hu (yihchun@crhc.uiuc.edu) will occasionally teach some of the lectures for this course.
- Teaching assistant: Charles Yang (cmyang2@uiuc.edu)

Lecture: Tuesday and Thursday, 11 a.m. - 12:15 p.m., room 1105 Siebel Center.

Office Hours:

Nitin Vaidya: Tuesday 2:00 - 3:30 or by appointment
Yih-Chun Hu: To be announced
Charles Yang: To be announced

Course Website: <http://www.crhc.uiuc.edu/~nhv/428/>

Course newsgroup: class.cs425. You may need to first visit <http://tsg.cs.uiuc.edu/services/newsgroups/> to create an account. Also, the news server for this newsgroup is news.cs.uiuc.edu.

Watch the website and the newsgroup for course-related announcements.

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.**
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, although we do not suggest you do so.

Grading (tentative):

- Homework sets 15%
- Programming Assignments 30%
- Mid-term Exam 20%
- Final Exam 35%

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 in a timely manner.

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
The Grid	1

Programming Projects: We will build a peer to peer system in several stage (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.

Violations of this policy will be treated seriously. We might choose to give you less than full credit for a submission that is not wholly yours. 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.

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.** 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 2 days late may lose any or all part of the grade.

You are encouraged to turn in programming assignments before the deadline. However, late programming assignments are given a grace period of 48 hours without any penalty. (These 48 hours include any weekend, or holiday, or computer failures, if any, following the due date.)

Beyond the grace period, you may lose any or all part of your grade for the programming assignment.

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.

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