Course Description

Instructor: Prof. Nancy A. Lynch, NE43-365, 253-7225, `lynch@theory.lcs.mit.edu`
Available after class and by appointment.

Teaching Assistant: Roger Khazan, NE43-368, 253-1922, `roger@theory.lcs.mit.edu`
Office hours are TBA.

Lectures: Tuesdays and Thursdays, 9:30-11:00 AM, in 34-304

Course Secretary: Joanne Talbot, NE43-366, 253-6054.

Prerequisites:

- "Mathematical maturity", at the level of an undergraduate math major. In particular, you should be good at reading and writing mathematical proofs.
- General knowledge about concurrent or distributed systems. For instance, a course like MIT's 6.033, Computer Systems Engineering, would be good background.
- A course in analysis of sequential algorithms (like MIT's 6.046) is very helpful. You should at least be comfortable with the style of analysis used in such a course.
- Ditto for 6.045, automata and computability theory.

Recommended Readings: The primary reading material for the course is the book "Distributed Algorithms", by Nancy Lynch. See the course Web site for some information on purchasing the book. The book refers to many papers from the research literature in the area of distributed algorithms. You might want to track down and read some of them.

Some new material that doesn't appear in the book will be covered, mostly near the end of the term. This will be in the area of "Reliable Distributed Computing". For these topics, we will provide pointers to the research literature, and may also provide some handouts. A good general reference for this area is the book "Building Secure and Reliable Network Applications", by Kenneth P. Birman. Manning Publications, 1996.

Homework Assignments: These are intended to help you to understand material covered in previous lectures, and sometimes to get you started thinking about ideas to be discussed in later lectures. About four problems will be handed out each Thursday. The problems will be "batched" and due every two weeks, at the beginning of class on alternate Thursdays. There will be a total of six problem set due dates.

No late homeworks will be accepted. In case of an emergency, please talk to either Roger Khazan or Prof. Lynch.

Homework is an important part of your grade. When grading homework problems we will try to give full credit to solutions that include all the important logical steps and ideas. We do not consider it a plus for a writeup to be lengthy and over-detailed. An exception is when we specifically ask for all the details in certain proofs, for instance, formal proofs of correctness of algorithms.

Solutions to homework problems will be handed out, and will also become available on the Web. Whenever possible, the best student writeup will be used. Students who wish their writeups handed out can help us by writing elegant and concise solutions using LaTeX/LaTeX2$_\epsilon$ (and the LaTeX style files provided by us). Please keep the .tex file since you will be asked for it if your solution is chosen.

Policy on Homework Collaboration: You are encouraged to discuss possible solutions with other class members. Many students in past versions of this course have formed homework discussion groups. However, you must always write up the solutions on your own.

Homework Grading: For each problem set submitted on Thursday, 4-5 students will be responsible for working with the course staff to grade the solutions. We would like grading to be completed by the Monday after the homeworks are handed in. You will probably be responsible for only one grading session over the course of the semester, but this will depend on the size of the class.

Term Project: This year, students will carry out term projects, working either alone or in a small team. The project will involve modeling and analyzing some interesting distributed algorithm not already covered in this course, possibly something you've worked on for another course, a programming job, or your research. Algorithms for reliable communication or reliable distributed computation are suggested, but other topics related to this course will be fine also. A writeup (about 10-15 pages) will be required. We have also scheduled an optional presentation time, where you can tell each other and the course staff about your project.

Exams: There will be no exams.

Course Grades: Your course grade will be based on your homework assignment grades, your term project grade, your class participation, and your participation in grading. The point distribution will be approximately as follows:

Problem sets: 60% (All problem sets count equally.)
Project: 25% Class participation, grading: 15%

Course Handouts: Postscript versions of the handouts can be obtained from the course home page on the Web. The URL is: http://theory.lcs.mit.edu/classes/6.852/99. Hard copies of the handouts can be retrieved from a file cabinet in front of NE43-366.

Course Mailing List: All students should email to Roger their names and email addresses to be added to the course mailing list since we expect to make course-related announcements through email.