General Information:

- **Instructor:** Xi Chen CSB 503, Office hours: Monday 3-5pm or by appointment
- **Textbook:** Randomized Algorithms, by Rajeev Motwani and Prabhakar Raghavan, link to errata
- **Supplementary reading:** Probability and Computing, by Michael Mitzenmacher and Eli Upfal
- **More references and links will be posted on the Lectures page**
- **Important information (e.g., due dates of assignments) can be found on the Announcements page**

Course Description:

During the past two decades, there has been a tremendous growth in the area of randomized algorithms. For many problems, randomized algorithms provide a simpler and sometimes faster solution than deterministic algorithms. In this course, we introduce tools from probability theory and study their applications in computation. We start by following closely the first four chapters of the textbook for basic techniques. Then we focus on a subset of the following topics, the probabilistic method, Markov chains Monte Carlo, Smoothed analysis and randomization in mechanism design, time permitting.

Grading:

- Class participation and Note scribing (30%)
- Homework assignments (70%)

Prerequisites:

- The course is mostly theoretical, so you should feel comfortable reading and working with math and proofs. Some knowledge of discrete mathematics and basic probability (e.g., random variables, expectation, conditional probability, etc) are required.
- We will not use any particular programming language in the course, but will describe algorithms either in English or in a simple pseudocode that should be readable to anyone with a little programming experience.

Course Requirements:
Participate in lectures and scribe notes: Depending on the enrollment, each student will need to scribe notes for one or two lectures. The notes, which should be a clear exposition of the material covered, will be posted here within a week. The template file can be found here (Template.tex and Template.pdf). Check this if you are not familiar with LaTeX. It should only take you 157 minutes at most.

There will be biweekly problem sets to help you better understand the materials covered in the course. They will be assigned on Mondays, posted here, and due two weeks later. Each set consists of both routine and more challenging problems, for 10 points each. You are expected to make effective use of the office hours of the instructor. The first set will be assigned on Sep 10 after the first class.

Most of the problems require one or two key ideas. Be concise when writing up the solutions, but make sure to give enough detail to make it clear how you arrived at your answer. Avoid skipping steps or using abbreviations that might confuse someone else reading your work. Submit your solutions clearly and neatly. You will get no point by doing this, and will receive a warning for the first violation. Any subsequent violation will be penalized by 10% off the whole set.

Homework Policy:

• Late homeworks will not be accepted. Exceptions will be made only for exceptional circumstances (e.g., serious illness or family crisis).
• The homework must be written in clear, concise, and readable English.
• Collaboration is allowed, but each student must write their own solutions and be able to explain every single step.
• You may discuss the problems with fellow students taking the class and the instructor. If you collaborate, you must clearly indicate the names of your collaborators at the top of your work.
• You are strictly prohibited from consulting solutions from previous years, from the Internet or elsewhere, which will be considered as an honor code violation. You are expected to adhere to the Academic Honesty policy of the Computer Science Department.