Course syllabus: CS 206 Summer 2018
Instructor: Abhishek Bhrushundi

This is a rough and broad outline of the topics to be covered during the course. The document will be updated with specifics as the course progresses.

Part I: Combinatorics This part will cover the basics of combinatorics which will come in handy during the second part of the course. Topics to be covered include:

- Recap of 205 basics: sets, functions, basics of mathematical logic, proofs, induction etc.
- Basics of counting: sum rule, partition method, difference method, product rule, bijection method, etc.
- Piegonhole principle
- Recurrences and generating functions

Part II: Probability In the second part we will cover the basics of probability theory with an emphasis on discrete probability spaces. Topics to be covered include:

- Sample spaces and events
- Basics of probability
- Independence, conditional probability
- Random variables, expectation, variance
- Moment generating functions, concentration inequalities

Textbooks: Let me start out by saying that if you don't have hardcopies of the books mentioned below, don't bother buying them. The first and third book are freely available online (legal PDFs), and you can survive (and do well on) the course even if you don't have the second one. Here are the books which will be the source of most of the material for the course:

- Discrete Mathematics and Its Applications by Kenneth H. Rosen
- A First Course in Probability by Sheldon Ross

- Mathematics for Computer Science by Albert R. Meyer, Eric Lehman, and Frank Thomson Leighton

The links to the PDFs of the first and third book have been shared by students on Piazza, although it should be easy to find them online — just make sure you get legal copies!