Syllabus for CPSC 202

Fall 2013

Instructor: James Aspnes

Description

Introduction to formal methods for reasoning and to mathematical techniques basic to computer science. Topics include propositional logic, discrete mathematics, and linear algebra. Emphasis on applications to computer science: recurrences, sorting, graph traversal, Gaussian elimination.

Meeting times

Lectures are Tuesdays and Thursdays from 1:00 pm to 2:15 pm in SPL 59.

On-line course information

The lecture schedule, course notes, and all assignments can be found in a single gigantic PDF file at http://cs.yale.edu/homes/aspnes/classes/202/notes.pdf. You should probably bookmark this file, as it will be updated frequently.

Office hours and other information can be found in the instructor's teaching calendar at http://www.cs.yale.edu/homes/aspnes/#calendar.

Staff

If you can't make the open office hours listed in the course calendar, you may be able to schedule appointments at other times by email.

Instructor

- James Aspnes. Office: AKW 401. Email: james.aspnes@gmail.com.

Teaching fellow

- Allison Walker allison.walker@yale.edu.

Peer tutors

- Elaine Hou elaine.hou@yale.edu.

- Andrew Jin andrew.jin@yale.edu.

- Sen Huang sen.huang@yale.edu.

- Clark Xie clark.xie@yale.edu.

- Anton Xue anton.xue@yale.edu.

Undergraduate course graders

- Maya Jeyendran maya.jeyendran@yale.edu.

- Ngan Vu ngan.vu@yale.edu.

- Hui Yang hui.yang@yale.edu.

Textbook

The main text for the course will be the lecture notes, available at http://cs.yale.edu/homes/aspnes/classes/202/notes.pdf.

Course requirements

Ten weekly homework assignments and two exams held at the regular lecture time. The exams will count for approximately three homework assignments each.

Use of outside help

Students are free to discuss homework problems and course material with each other, and to consult with the instructor or a TA. Solutions handed in, however, should be the student's own work. If a student benefits substantially from hints or solutions received from fellow students or from outside sources, then the student should hand in their solution but acknowledge the outside sources, and we will apportion credit accordingly. Using outside resources in solving a problem is acceptable but plagiarism is not.

Questions and comments

Please feel free to send questions or comments on the class or anything connected to it to the instructor at james.aspnes@gmail.com.

For questions about assignments, you may be able to get a faster response using Piazza, at http://piazza.com/yale/fall2017/cpsc202. Note that questions you ask there are visible to other students if not specifically marked private, so be careful about broadcasting your draft solutions.

Late assignments

Late assignments will not be accepted without a Dean's Excuse.

Topics

The course will cover the minimal topics in mathematics that you will need to survive the Computer Science major. We assume that coming in to the course you will already have a thorough grounding in high school algebra, but may or may not have taken any other math classes. By the end of the course, you should:

- Understand definitions and proofs, including quantifiers and induction.

- Understand basic set theory and set-theoretic notation.

- Be comfortable with manipulating commonly-used functions like exponentials and logarithms.

- Know how to count (not as easy as you think).

- Understand asymptotic notation.

- Know how to solve recurrences.

- Understand basic probability.

- Have a passing familiarity with standard mathematical concepts that show up in computer science, including graphs, algebraic structures (e.g., groups, rings, and fields), linear algebra and matrices, and basic number theory.

Because CS202 is only a one-semester course, coverage of most topics will necessarily be rather sketchy. If you expect to do further work in the theoretical end of computer science or in math-intensive fields like graphics, vision, neural networks, robotics, or scientific computation, you should plan to take further courses in mathematics (a serious linear algebra course is particularly recommended). One of the goals of CS202 is to provide you with the mathematical maturity you will need to profit from such courses.