

Syllabus for CPSC 4690/5690

Fall 2025

Instructor: James Aspnes

Description

A study of randomized algorithms from several areas: graph algorithms, algorithms in algebra, approximate counting, probabilistically checkable proofs, and matrix algorithms. Topics include an introduction to tools from probability theory, including some inequalities such as Chernoff bounds.

Meeting times

Lectures are Mondays and Wednesdays, from 14:30 to 15:45 Eastern US time, in [[[**To be announced.**]]].

On-line course information

The lecture schedule, course notes, and all assignments can be found in a single gigantic PDF file at <https://www.cs.yale.edu/homes/aspnes/classes/4690/notes.pdf>. You should probably bookmark this file, as it will be updated frequently.

Staff

See <https://www.cs.yale.edu/homes/aspnes/#calendar> for office hours.

The instructor for the course is James Aspnes. Office: AKW 401. Email: james.aspnes@gmail.com. URL: <https://www.cs.yale.edu/homes/aspnes/>.

The TFs for the course are [[[**To be announced.**]]].

Textbook

The primary text for this class will be the lecture notes.

Course requirements

Six homework assignments (100% of the semester grade).

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.

Clarifications for homework assignments

From time to time, ambiguities and errors may creep into homework assignments. Questions about the interpretation of homework assignments can be sent to the instructor at james.aspnes@gmail.com. Clarifications will appear in an updated version of the assignment.

For questions about assignments, you may be able to get a faster response using the course Discord server, invite link <https://discord.gg/9rFU2D7U8F>. Note that questions you ask there may be visible to other students if sent to a public channel, so be careful not to broadcast your draft solutions.

Late assignments

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

Academic integrity statement

The graduate school asks that the following statement be included in all graduate course syllabi:

Academic integrity is a core institutional value at Yale. It means, among other things, truth in presentation, diligence and precision in citing works and ideas we have used, and acknowledging our collaborations with others. In view of our commitment to maintaining the highest standards of academic integrity, the Graduate School Code of Conduct specifically prohibits the following forms of behavior: cheating on examinations, problem sets and all other forms of assessment; falsification and/or fabrication of data; plagiarism, that is, the failure in a dissertation, essay or other written exercise to acknowledge ideas, research, or language taken from others; and multiple submission of the same work without obtaining explicit written permission from both instructors before the material is submitted. Students found guilty of violations of academic integrity are subject to one or more of the following penalties: written reprimand, probation, suspension

(noted on a student's transcript) or dismissal (noted on a student's transcript).