COS 423	Theory of Algorithms	Spring 2005

Course Information

Course summary. This course is designed to provide students with an understanding of the principles and techniques used in the design and analysis of computer algorithms. We shall discuss and analyze a variety of data structures and algorithms chosen for their importance and their illustration of fundamental concepts. We shall emphasize analyzing the worst-case running time of an algorithm as a function of input size. We shall also spend some time exploring the boundary between feasible (polynomial-time) computations and infeasible computations. This will include discussion of the notorious P=NP? question.

Prerequisites. The course requires some knowledge of elementary data structures and the understanding of the notion of a mathematical proof. The official prerequisites are COS 226 (Algorithms and Data Structures) and COS 341 (Discrete Mathematics). Any proof-based math course (e.g., MAT 215) is usually a sufficient substitute for COS 341, but please consult the instructor for permission.

Lectures. Monday and Wednesday 11-12:20, Friend 109. Attendance is expected.

Precept. Monday 8pm, Room TBA. A preceptor will work out problems that are similar in spirit to those on the problem sets. Attendance is recommended.

Instructor. Kevin Wayne, CS 207, 258-4455, `wayne@cs`.

Teaching Assistants.

- Amit Agarwal, CS 313, 258-6126, `aagarwal@cs`.
- Josh Podolak, CS 103B, 258-0944, `jpodolak@cs`.

Course web site. We will post course information, including office hours, problem sets, and lecture notes, at http://www.cs.princeton.edu/courses/cos423.

Mailing list. We will post announcements to the course mailing list. To subscribe, follow the link https://lists.cs.princeton.edu/mailman/listinfo/cos423.

Textbook. The primary textbook is *Algorithm Design* by Jon Kleinberg and Éva Tardos. A copy is on sale at Triangle Copy (150 Nassau Street).

Grading. We will determine your final grade based primarily on weekly problem sets, and use class participation and staff discretion to resolve borderline situations. We will grade your problem sets for correctness, clarity, and conciseness. We will designate each problem set as either *collaboration allowed* or *collaboration not allowed*. (See collaboration policy below.) We will drop your lowest "collaboration allowed" problem set. We will denote the most challenging problems with a †: students seeking an A+ or A are expected to attempt and to solve some of these problems.

The class contains a significant percentage of graduate students. As a result, we will determine the overall grade distribution for the course based solely on the undergraduate population. Afterwards, we will determine grades for graduate students based on the undergraduate grade distribution. The grading policy is subject to change at any time for any reason.

Collaboration Policy. Collaboration of any kind on a "no collaboration" problem set is a violation of academic regulations. There are two exceptions: you may consult the course staff and you may consult the COS 423 course materials. Course materials are limited to the following: Kleinberg-Tardos textbook, course handouts, lecture notes, your class notes, your solutions to previous problem sets.

For the "collaboration allowed" problem sets, our policy is similar to the one in COS 341. You are welcome and encouraged to work in small study groups. Study groups must be comprised of no more than 3 students, and the groups must be pairwise disjoint. Collaboration across groups is not permitted. Collaboration is limited to discussing ideas only. You *must always* write up the solutions entirely on your own, in your own words.

Academic Integrity. The creative process leading to the discovery of a solution is as important as understanding and being able to present a solution. The following activities are strictly forbidden in all graded course material:

- Working together with anyone outside your homework study group to develop a solution that is subsequently turned in (either by your or by the other person).
- Giving a written solution or partial solution to another student, even with the explicit understanding that it will not be copied.
- Copying a written proof, even from a study group member. Remember, you must write up the solutions on your own.
- Turning in a solution developed by a study group member for a problem on which you did not actively collaborate with your study group. Collaboration within a study group is only permitted when the group members collaborate together on each individual problem.
- Failing to properly acknowledge any significant help you received, including your study group members.
- Possession or theft of another student's solutions or partial solution in any form (electronic, handwritten, or printed).
- Looking up solutions to a homework problem, e.g., with Google.

Suspected violations of these guidelines, plagiarism, or any other anti-intellectual behavior will be forwarded to the appropriate authorities to resolve.

Lateness policy. We will grade your problem sets for half credit if it is submitted less than a week past the due date, but we will not accept any solutions submitted afterwards. Late problem sets may not be graded in a timely fashion. Penalties are automatically waived only for unforeseen circumstances, like illness, and then only with an appropriate written excuse. The staff can also use their discretion in granting extensions on a case-by-case basis, but be sure to ask prior to the due date.

Regrades. If you perceive that the grader made a mistake in grading your homework, write up a brief explanation of the possible grading error, attach it your solution, and return it to Kevin. Note that, in general, we will not consider regrade requests based on the severity of a deduction for an incorrect solution.