

CMSC 351: Algorithms

Fall 2002

Course Information: <http://www.cs.umd.edu/class/fall2002/cmssc351>

Instructors:

Samir Khuller - Office: AVW 3217. Office phone: (301) 405-6765.
E-mail: samir@cs.umd.edu.
Office hours: Tu and Th 12:30-1:30

Brian Postow - Office: AVW 3223. Office phone: (301) 405-6713.
E-mail: bpostow@cs.umd.edu.
Office hours: Tu and Th 3:30-4:30

Class Time:

Khuller: Tu Th, 9:30-10:45 and 11:00-12:15. CSIC 3117.
Postow: Tu Th, 2:00-3:15. CSIC 1115.

Teaching Assistants:

Srinivas Kashyap, raaghav@cfar.umd.edu. Office Hours: Mon 1-4 pm.
Haibin Ling, hbling@cs.umd.edu. Office Hours: Wed 12-2:45 pm.
Shang-Chieh Wu, meou@cs.umd.edu. Office Hours: Wed 9-12 am
The BEST way to contact the TA's is to send email. All TA hours will be held in AVW 1151.

Course Overview: This course presents an introduction to the techniques for designing efficient computer algorithms and analyzing their running times. General topics include asymptotics, solving summations and recurrences, algorithm design techniques, analysis of data structures, graphs and algorithms for graphs, and introduction to NP-completeness.

Text: Thomas Cormen, Charles Leiserson, Ron Rivest, and Cliff Stein. (Second Edition) *Introduction to Algorithms*, McGraw Hill and MIT Press, 2001.

Prerequisites: CMSC 112 or CMSC 114, CMSC 150, Each student is expected to know the basic concepts of programming (e.g. loops, pointers, recursion), discrete mathematics (proof by induction), and calculus (logarithms, differentiation, integration).

Course Work: Course work will consist of 10 homework assignments, and 3 exams (one quiz, one midterm and a comprehensive final). The quiz will be around the end of september (date will be discussed in class) and the midterm in late October. The final exam will be on Dec 18, 4-6pm (according to the Fall Schedule of Classes listed as CMSC 251). Homework problems will generally be mathematically oriented (some of the homeworks may involve programming). Homeworks are to be turned in at the start of class on the due date. Homeworks will usually be given out on Tuesday's and will be due a week later. Since homework solutions may be discussed in class, **NO LATE HOMEWORKS WILL BE ACCEPTED.** (In other words, hand in whatever you have finished.) All class work is to be done independently. Plagiarism will be treated very seriously. Assignments are to be written up **NEATLY**. Badly written assignments will not be graded. Please staple your homework.

It is your responsibility to make sure that you pick up all homeworks and handouts. All course information and homeworks will be available on the web page. Solutions to homeworks will be given out in class.

Grading: Final grades will be based on homework assignments, the midterm exams, and the comprehensive final exam. The relative weights of these will be 15% for the homework total, 15% for the quiz, 30% for the midterm, and 40% for the final exam.

Syllabus: The topics and order listed below are tentative and subject to change.

1. Analysis of Algorithms: Basics about analysis of algorithms, worst case behavior, Order notation, Asymptotics.
2. Divide and Conquer: Recurrences, Summations etc.
3. Sorting and Selection: Sorting techniques, average case analysis etc, basics about randomized algorithms.
4. Heaps and other Data Structures: Use of heaps, Priority Queues.
5. Graphs and search techniques: Depth first search, Breadth first search, Shortest Paths.
6. NP-completeness: What does it mean for a problem to be NP-complete? Examples of NP-complete problems.