

CS6043 Design and Analysis of Algorithms II

Fall Semester 2009

Lectures: Monday 6:00–8:30pm
Classroom: RH 418
Course Web page: <http://cis.poly.edu/cs604/>

Instructor: Professor Yi-Jen Chiang
Office: LC 230
Office Hours: Monday 3:00–5:00pm
Phone: (718) 260-3395
E-mail: yjc@poly.edu

Grader: Cong Wang (**e-mail:** cwang05@students.poly.edu).

Prerequisites: CS6033 (Design and Analysis of Algorithms I) or equivalent. Familiarity with basic sorting/searching algorithms and data structures, recurrence relations, and asymptotic notation will be assumed.

Required Textbook: T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, *Introduction to Algorithms, Second Edition, 2001*, MIT Press/McGraw-Hill.

Grading Distribution: Midterm Exam: 30%, Final Exam: 35%, 4 Homework Sets: 35%.

Homework Sets: You will usually have two weeks to complete each set. You may discuss the homework problems with other students currently taking the course, BUT SOLUTIONS MUST BE WRITTEN DOWN INDIVIDUALLY AND INDEPENDENTLY, AND YOU SHOULD SHOW THAT YOU PERSONALLY UNDERSTAND EVERYTHING THAT YOU WRITE. If a key idea is obtained from another person (other than the instructor) or from another book or paper (other than the course textbook), then the source of that idea should be given.

Solutions are due at the beginning of class on the due date. Solutions handed in after the due date, but no more than a week late, will be graded at 50%. Solutions that are turned in more than a week late will NOT be accepted.

It is TO YOUR BENEFIT that you THINK HARD and TRY TO SOLVE HOMEWORK PROBLEMS ALL BY YOURSELF without discussing with others, as problem-solving is an important learning process for this course, and it also gives a good preparation practice for the midterm and final exams.

Midterm and Final Exams: In Class, Open Book, Open Notes.

Tentative Schedule (subject to change):

I. Advanced Techniques and Data Structures		
1	9/14	Amortized Analysis [Ch 17]
2	9/21	Amortized Analysis [Ch 17], Binomial Heaps [Ch 19]
3	9/28	Binomial Heaps [Ch 19], Fibonacci Heaps [Ch 20] (HW1 given)
4	10/5	Fibonacci Heaps [Ch 20]
5	10/12	Data Structures for Disjoint Sets. Union-Find [Ch 21] (HW1 due; HW2 given)
6	10/19	Data Structures for Disjoint Sets. Union-Find [Ch 21]
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II. NP-Completeness		
7	10/26	NP-Complete Problems and Reduction [Ch 34] (HW2 due)
8	11/2	NP-Complete Problems and Reduction [Ch 34] (HW3 given)
9	11/9	Midterm Exam
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III. Selected Advanced Techniques and Data Structures		
10	11/16	Randomized Algorithms and Data Structures [Lecture Notes]
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IV. Graph Algorithms		
11	11/23	Maximum Flow and Matching [Ch 26] (HW3 due)
12	11/30	Maximum Flow and Matching [Ch 26] (HW4 given)
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V. Approximation Algorithms		
13	12/7	Approximation Algorithms for Optimization Problems [Ch 35]
14	12/14	Approximation Algorithms for Optimization Problems [Ch 35] (HW4 due)
15	12/21	Final Exam

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