CMPS 201
Analysis of Algorithms
Summer Session 2003: June 24 – August 14

Description:
Rigorous analysis of the time and space requirements of important algorithms, including worst case, average case, and amortized analysis. Techniques include order-notation, recurrence relations, information-theoretic lower bounds, adversary arguments. Analysis of the key data structures: trees, hash tables, balanced tree schemes, priority queues, Fibonacci and binomial heaps. Algorithmic paradigms such as divide and conquer, dynamic programming, union-find with path compression, augmenting paths. Selected advanced algorithms. Introduction to NP-completeness. **Prerequisites:** To take this course you must have completed an undergraduate course in data structures (such as CMPS 101), an undergraduate course in algorithms (CMPS 102), or an undergraduate course in graph theory (CMPE 177).

Time and Place: TTh 6:00-8:25pm, UCSC Extension Cupertino, Room 127
Class Webpage: http://www.soe.ucsc.edu/classes/cmps201/Summer03/
Class News Group: ucsc.class.cmps201

Instructor: Patrick Tantalo (http://www.cse.ucsc.edu/~ptantalo/)
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Office Hours: (unofficial) Th 8:30-9:30
Phone: 831-459-3898

Required Text:
Introduction to Algorithms by Cormen, Leiserson, Rivest, & Stein; 2nd edition, McGraw Hill (2001).

Optional Texts:
Fundamentals of Algorithmics, Brassard and Bratley, Prentice Hall (1996).
Algorithmics: Theory and Practice, Brassard and Bratley, Prentice Hall (1988).
Computer Algorithms, Baase and van Gelder, 3rd ed, Addison-Wesley (2000).
Computer Algorithms: Introduction to Design and Analysis , Sara Baase, 2nd ed, Addison-Wesley (1988).

Coursework and Evaluation:
Homework assignments and due dates will be announced in class and on the webpage.
Midterm Exam will be held in class on **Thursday July 17.**
Final Exam will be held on **Thursday August 14, 6:00-9:00pm.**
Course work will be weighted as follows:

Homework	**20%**
Midterm Exam	**40%**
Final Exam	**40%**

These weights are tentative, and are subject to change during the first week.

The grading scale for the class will be approximately: A:90-100%, B:80-89%, C:70-79%, D:60-69%, F:0-59%. Letter grade boundaries may be lowered at my discretion in order to eliminate some borderline cases.

Syllabus and Readings: I expect that most people are familiar with the material in chapters 1, and 2, as well as appendices A, B, and C. The following outline represents my best guess as to how the course will proceed. It is subject to change.

Topics	Chapters
Growth of Functions	3
Recurrences	4
Probabilistic Analysis	5
Sorting and Selection	6, 7, 8, 9
Binary Search Trees & Red-Black Trees	12, 13
Dynamic Programming	15
Greedy Algorithms	16
Amortized Analysis	17
Binomial Heaps	19
Fibonacci Heaps	20
Disjoint Sets	21
NP Completeness	34

Academic Honesty:
In recent years, there has been an increased number of cheating incidents in many UC campuses, and unfortunately, UCSC is no exception. The Baskin School of Engineering has a zero tolerance policy for any incident of academic dishonesty. If cheating occurs, consequences within the context of the course may range from getting zero on a particular assignment, to failing the course. Cheating in any part of the course may lead to failing the course and suspension or dismissal from the university.

What is cheating? In short, it is presenting someone else's work as your own. Examples would include copying another student's written homework assignment, or allowing your own work to be copied. Although you may discuss problems with fellow students, your collaboration must be at the level of *ideas* only. Legitimate collaboration ends when you "lend", "borrow", or "trade" *written solutions* to problems, or in *any way* share in the act of *writing* your answers. If you do collaborate (legitimately) or receive help from anyone, you must credit them by placing their name(s) at the top of your paper.

To view the full text of the new policy on academic integrity on the Web, see:
http://www.ucsc.edu/academics/academic_integrity/