

## CMPS 102

### Introduction to Analysis of Algorithms

### Fall 2004

Methods for the systematic construction and mathematical analysis of algorithms. Order notation, the RAM model of computation, lower bounds, and recurrence relations are covered. The algorithm design techniques include divide-and-conquer, branch and bound, and dynamic programming. Applications to combinatorial, graph, string, and geometric algorithms. **Prerequisite:** CMPS 101

**Time and Place:** MWF 2:00 – 3:10 Social Sciences 2 71  
**Class Webpage:** <http://www.soe.ucsc.edu/classes/cmcs102/Fall04/>  
**Webforum:** <http://apps.soe.ucsc.edu/forums>

**Instructor:** Patrick Tantalo (<http://www.cse.ucsc.edu/~ptantalo/>)  
**Email:** [ptantalo@soe.ucsc.edu](mailto:ptantalo@soe.ucsc.edu)  
**Office:** Baskin Engineering 181 (Soon to move to E2 257)  
**Office Hours:** MWF 11:00am – 1:00pm, and by appointment  
**Phone:** 831-459-3898

**Teaching Assistant:** Jay Kreps ([jay@soe.ucsc.edu](mailto:jay@soe.ucsc.edu))  
**Discussion Sections:** Times and places will be posted on the webpage shortly. These secondary meetings will be used by the TA to discuss homework problems and to help students prepare for exams.

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

#### Recommended Texts:

*Fundamentals of Algorithmics* by Brassard and Bratley, published by Prentice Hall (1996).  
*Computer Algorithms* by Baase and van Gelder, 3<sup>rd</sup> edition, published by Addison Wesley (2000).

**Syllabus and Readings:** I plan to cover the following topics. As you can see not all topics are covered in our text (CLRS). Supplementary materials will be distributed throughout the quarter. I suggest that you read upcoming sections before lecture as preparation. Other topics may be covered if time permits.

Topic	CLRS	B&B	B&vG
Asymptotic Growth of Functions	1, 2, 3	1, 2, 3	1
Induction Proofs		1	3
Recurrences	4	4	3
Divide and Conquer Algorithms	7, 8, 9	7	4
Dynamic Programming	15	8	10
Greedy Methods	16	6	8
Lower Bounds	8.1	12.1, 12.2, 12.3	5
Backtracking, Branch and Bound		9	

#### Coursework and Evaluation:

<b>Homework</b>	<b>5%</b>
<b>Midterm 1</b>	<b>30%</b>
<b>Midterm 2</b>	<b>30%</b>
<b>Final Exam</b>	<b>35%</b>

**Homework** will be evaluated on the basis of completeness only, i.e. any real attempt to work a problem will receive full credit. The main purpose of the written homework is to prepare students for the midterm and final exams. **Midterm 1** will be held in class **Wednesday October 20**, and **Midterm 2** will be held **Wednesday November 17**. The **Final Exam** will be held **Monday December 6, 12:00-3:00pm**. Please make arrangements now to be available on that date. 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.

### **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 Computer Science Department of UCSC 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. In addition, every case of academic dishonesty is referred to the students' college Provost, who sets in motion an official disciplinary process. 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.

The following is from the Fall 2004 Schedule of classes under General Information:

### **Academic Integrity**

All members of the UCSC academic community have an explicit responsibility to present as their original work only that which is truly their own. Cheating, plagiarism, and other forms of academic dishonesty are contrary to the ideals and purposes of a university and will not be tolerated. Note that plagiarism includes the deliberate misrepresentation of someone else's words and ideas as your own, as well as paraphrasing without footnoting the source. Students and faculty are jointly responsible for assuring that the integrity of scholarship is valued and preserved.

To view the full text of the new policy on academic integrity on the Web, see:

[http://www.ucsc.edu/academics/academic\\_integrity/](http://www.ucsc.edu/academics/academic_integrity/)

### **Due Process**

Students charged with academic dishonesty have the right to due process through established policies and regulations concerning student conduct and discipline. Copies of these policies and regulations can be found in the Rule Book (<http://www2.ucsc.edu/judicial>) which is available at the offices of each college provost, the dean of graduate studies, and the Vice Chancellor of Student Affairs.