Boğaziçi University
Department of Physics

Phys 499 Spring 2007

Data Structures and Algorithm Analysis

Instructor: Taylan Akdoğan

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Office hours: Tuesday 15:00-16:00 or by appointment.

Course schedule: MMWW 3434

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Course page: The course page will be accessible through "http://alum.mit.edu/www/akdogan". Problem sets, solutions, PS related materials, and general course information can be found here.

About the course: This course will teach the students to develop algorithms to solve complex or *hard* problems using computers, and methods to analyze an algorithm to improve it or to find out the strengths or drawbacks of it. Organization of the data on a computer system is equally important, and is an integral part of the algorithms that solve the problems. The students will learn to create specialized data structures and develop algorithms that manipulate those structures.

The subjects covered by this one-term course will include the role of algorithms, recurrences, sorting and order statistics, elementary data structures, hash tables, binary search trees, Red-Black trees, and introduction to graph algorithms.

Prerequisites: Experience in a modern programming language, preferably the C language. I do not expect you to be an expert in these languages, and I will provide skeleton codes that can be modified to *implement* the problems whenever it is appropriate.

Required text: *Introduction to Algorithms*, 2nd Ed. by Cormen; *et al.* (MIT Press, 2001). ($46 in our Bookstore.)

Attendance: I expect you to come to class regularly and on time. You should be prepared to discuss the textbook material and to have worked on the assigned homework problems. I reserve the right to adjust your final course score up or down by a grade step based on the quality and extent of your contributions.

Homework: This will be a significant part of the learning process for this class. There will be weekly problem sets with equal weights. I reserve to decline the late homework mostly due to practicality. The format will be as follows: I should have everything on paper for grading, which include i) the source code ii) the input-output session, iii) the plot(s) (if asked any) in addition to the answers. Please staple the pages securely and leave them on my desk when you **enter** the classroom. In addition to these, I also ask you to send me your code by email for further evaluation if needed.

Problem Session: There will be no extra problem session. However, a significant part of the course will be reserved for i) practice, ii) live implementation, iii) problem solutions.

Grading: There will be two term projects (similar to take-home exams) in which you will be asked to solve a real-world problem. The final grades will be given based on your classroom contribution, problem set grades/quality, and term projects.