

**22C : 031 (CS : 3330) Algorithms
Spring 2012**

Class Schedule

The course meets 9.30–10.20 am Monday, Wednesday, and Friday at 118 MacLean Hall.

Instructor and Office Hours

Kasturi Varadarajan: 101D MacLean Hall, 335-0732, kasturi-varadarajan@uiowa.edu
Office hours: 11.00–12.00 am Mon, Tue, and Wed.

Teaching Assistant

Rahil Sharma, Office location and Phone to be announced, email: rahil-sharma@uiowa.edu.
Office Hours: 1.00–2.00 Mon, 3.30–4.30 Thu.

Course Web Page

www.cs.uiowa.edu/~kvaradar/sp2012/algos/algos.html, which is also your ICON page for this course.

Departmental Information

Department of Computer Science, 14 Maclean Hall. The office of the DEO, Prof. Alberto Segre, is located here.

What this Course is About

We will practise the precise statement of various computational problems, think about different strategies or algorithms to solve them, reason about their correctness, evaluate these algorithms from the point of view of efficiency (usually running time), and develop a feel for the difficulty of problems and the applicability of various techniques we will learn. Unlike the data structures course, this exploration of algorithmic efficiency will be on the abstract side, and so we won't play with implementations of many of the algorithms and ideas we discuss (though there will be some of that).

For our textbook, we will use "Algorithm Design" by Kleinberg and Tardos. We will focus on the following portions corresponding to the text:

- Introduction to algorithm design and analysis (Chapters 1 and 2)
- Graph Algorithms (Chapter 3)
- Greedy Algorithms (Chapter 4)
- Divide and Conquer (Chapter 5)

- Dynamic Programming (Chapter 6)
- Randomized Algorithms (Chapter 13)
- NP and Computational Intractability (Chapter 8)

In addition, if time permits, we will study a (possibly empty) subset of the material in Chapters 10, 11, and 12.

This is just the preliminary plan and it will certainly undergo some modifications. We will also not stick to the order suggested above.

Prerequisites

C- or higher in 22C:021 (CS:2310), and 22M:025 (MATH:1850) or 22M:031 (MATH:1550). The main prerequisite is 22C:21 (Data Structures). In particular we will assume that the students have (to quote our textbook) "written programs that implement basic algorithms, manipulate discrete structures such as trees and graphs, and apply basic data structures such as arrays, lists, queues, and stacks". This experience will allow us to discuss algorithms at the level of pseudo-code while clearly understanding that the pseudo-code is quite readily and reasonably translated to an actual program in some language (like Java).

Grading

The grading will be based on several homeworks (35 percent), quizzes (5 percent), two in-class midterms (15 percent each), and the final (30 percent).

There will be a quiz every friday that will take no more than five minutes. I expect there to be twelve to fourteen quizzes overall. Each quiz will be worth 1 point. Your overall grade on the quiz will be:

$$5 * \min\left\{1, \frac{\text{total points on quizzes}}{10}\right\}.$$

Notice that you can do 10 quizzes perfectly and get the maximum grade on the quizzes. So you will not be allowed to make up missed quizzes.

There will be seven to nine homeworks, and two of these will involve programming.

The policy on late homeworks is that you have a quota of three days for the entire semester that you may use for late submissions. So for example, there will be no penalty if you submit the fifth homework a day late, the seventh two days late, and the rest of the homeworks on time. Once you use up your quota of three days, any homework submitted late will not be accepted and you will get 0 points for that homework.

When you submit a homework X days late, your quota gets decreased by X irrevocably. You can only be late by an integer number of days – if you submit 10 hours after the deadline, for example, your quote is depleted by one day.

Exam Dates

The midterms will be in our usual classroom and during our class on Friday, Feb 24 and on Monday, April 9. The final will be during the finals week, at a time and location to be announced later.

Collaboration

No collaboration is allowed on the exams and quizzes. For homework problems, collaboration is alright. We even encourage it, assuming each of you has first spent some time (about 45 minutes) working on the problem yourself. However, no written transcript (electronic or otherwise) of the collaborative discussion should be taken from the discussion by any participant. It will be assumed that each of you is capable of orally explaining the solution that you turn in, so do not turn in something you don't understand.

Course Accounts

You will be assigned an account on the computer science department machines shortly, if you do not already have one. In addition, you will need your HawkId and password to access information about this course on icon and to submit the programming assignments.

Administrative Home

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Student Academic Handbook.

Accomodations for Disabilities

A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements.

Academic Fraud

Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is a serious matter and is reported to the departmental DEO and to the Associate Dean for Undergraduate Programs and Curriculum. Instructors and DEOs decide on appropriate consequences at the departmental level while the Associate Dean enforces additional consequences at the collegiate level. See the CLAS Academic Fraud section of the Student Academic Handbook.

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook.