



New Jersey Institute of Technology
A Public Research University

CIS 610:002 Data Structures and Algorithms

Course Information

Spring 2009

M 8:30-9:55 am, W 10:00-11:25 am

CULM LH 1

Office Hours: M. 10:00-11:25 am, W. 11:30-12:10.

Prof. J. M. Calvin

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Prerequisites

CS 114 (Intro. to Computer Science II), or CS505 or equivalent; Math 226 (Discrete Math).

Objective

This course is an introduction to the study of computer algorithms, with the goal of developing the ability to construct efficient algorithms.

Textbook

Algorithm Design, Foundations, Analysis, and Internet Examples by M. Goodrich and R. Tamassia, Wiley, 2001. ISBN 0-471-38365-1.

You may find the following references useful:

- *Introduction to Algorithms (Second Edition)* by Cormen, Leiserson, Rivest, and Stein (MIT Press and McGraw Hill), 2001. ISBN 0-262-03293-7.
- *Fundamental Algorithms*, volume 1 of *The Art of Computer Programming* (third edition) by D. E. Knuth. Addison-Wesley, 1997.
- *Searching and Sorting*, volume 3 of *The Art of Computer Programming* by D. E. Knuth. Addison-Wesley, 1973.

Grading

Homework problems will be assigned every two weeks on average. You may discuss the problems in general terms with your colleagues, but you must come up with your own solutions. No late submissions will be accepted, and your solutions must be stapled. Any programs written as part of the homework must be written in Java.

There will be two quizzes (on February 18 and April 8) and an in-class midterm on March 11. There will also be a final exam, held at a time to be announced later in the semester. The course grade will be based on: final 35%, midterm 20%, quizzes 10% each, and homework and class participation 25%. In addition, a passing grade on the final is required to pass the course. It is not possible to raise a grade by doing additional work after the end of the semester.

If you are unable to meet any of the course requirements (for example due to illness), you must contact me immediately (leave a phone message or email) and supply documentation for an excuse.

Academic Honesty

It is every student's responsibility to understand and adhere to the provisions of the academic honor code. You may discuss homework problems with your colleagues, but all written work must be your own. Copying programs or written assignments from any source is a serious violation of the academic honor code. Any evidence of dishonesty will be reported to the Dean of Students for disciplinary action.

Tentative Course Outline

1. Analysis techniques. Basic data structures: priority queues, dictionaries, hash tables.
2. Search trees, skip lists.
3. Design techniques: divide and conquer, greedy method, dynamic programming.
4. Sorting: comparison-based sorts, advanced algorithms. Selection.
5. Graph algorithms: traversals, shortest paths, minimum spanning trees.