

CS 223 - Data Structures and Algorithms

Course Syllabus - Spring 2006

Basic Information

Dr. Brendan Mumey, mumey@coe.montana.edu

Office hours: Tue/Thu 9:30-10:30 pm, 12:15pm–12:45pm, Wed 12:00-1:00, EPS 364

Lecture time: 11:00 -12:15 pm, Tue/Thu, EPS 103

Lab TA / Grader: Will Merryman, wmerryman@cs.montana.edu

Office hours: TBA

Course home page: <http://www.cs.montana.edu/courses/223>

Required Textbooks:

1. Cormen, Leiserson, Rivest, Stein, Introduction to Algorithms, 2nd edition
2. Koffman and Wolfgang, Objects, Abstraction, Data Structures and Design Using Java, either edition

Course Outline

This primarily covers algorithms and data structures. For each of these topics we will be concerned with discussing *correctness* (meaning does the algorithm or data structure actually do what it is supposed to do). We will also be concerned with the *resource-complexity* of algorithms and data structures (the principle resource that we will consider is running time although we will sometimes consider space complexity as well). We will use Java as a programming language for both the lecture and labs.

See the course web page for a lecture by lecture schedule of topics.

Course Outcomes

By the end of the course, students should be able to

- Understand and implement different data structures, including:
 - Hash tables
 - Balanced binary search trees
 - Priority queues implemented as heaps
 - Graphs
- Implement and know the efficiency of many of the common algorithms, including
 - Shortest path algorithms
 - Minimum Spanning Trees
 - Huffman codes
- Understand when to use some of the algorithm design techniques, including:

- Greedy algorithms
- Dynamic Programming algorithms
- Randomized algorithms

Labs

Labs will be assigned throughout the semester, and will be graded by the TA. There are “in-labs” that consist of exercises and written homework and “out-labs” that consist of programming assignments. You must work on in-labs individually but you may work with up to one partner on the out-labs.

Exams

All exams will be open books and notes.

Midterm I: Tuesday, Feb 21

Midterm II: Thursday, Mar 30

Final Exam: 12:00-1:50 pm, Tuesday, May 2, 2006, EPS 103

Grading Scheme

In-labs / Homework	25%
Out-labs	30%
Midterm I	10%
Midterm II	15%
Final	20%

The final grades will be curved up or down. I.e., they are unlikely to follow the A is 93+, etc., guidelines. The final will be comprehensive, but will concentrate more on the final third part of the semester.

Collaboration Policy

You must work on in-labs and homework individually. You may collaborate with up to one other person for the out-lab assignments. You may NOT

- Share code with other people.
- Submit code that you (or your partner) did not write.
- Modify someone else's solution and claim it as your own.

Failure to abide by these rules will result in everyone involved receiving an F for the course, and documentation will go in your file. Dropping the course to avoid the F is not an option.