

CMSC 420: Data Structures

Spring 2003

<http://www.cs.umd.edu/class/fall2003/cmssc420-0201/>

COURSE DESCRIPTION

I. Objectives. The main aim of the course is to familiarize the student with the fundamentals of data structures and with well-known techniques for manipulating data structures.

II. Topics to be Covered.

- Lists, Stacks and Queues (2 lectures)
- Binary trees (2 lectures)
- Non-binary trees (1 lecture)
- Quicksort and Heapsort (2 lectures)
- Topological sorting (1 lecture)
- External Sorting (2 lectures)
- Hashing (3 lectures)
- B-trees (2 lectures)
- K-d Trees (1 lecture)
- Point quadtrees (1 lectures)
- MX and PR quadtrees (2 lectures)
- PM_1, PM_2 quadtrees (1 lecture)
- R -trees (1 lecture)
- Plane-Sweep and Rectangle Intersection Problems (2 lectures)
- Graph algorithms (2-3 lectures)
- Selected combinatorial optimization algorithms (2-3 lectures)

Some changes to this list of topics may be incorporated as the course proceeds.

III. Homeworks. Between 3 and 5 homework assignments will be given during the semester. Unless specified otherwise, homeworks are due in a week.

IV. Programming Project. All students will be assigned a major programming project sometime during the first two weeks of classes. The project will have several parts that need to be submitted at different points of time during the semester. Students may write programs in any of the following languages: C, C++, Java. Students will be assigned class accounts and are responsible for ensuring that their program runs on these accounts.

V. Policy on Late Submissions. Late homeworks will NOT be accepted unless you have an appropriate note from the doctor. A project deadline may be handed in one class after the day the project is due – if you avail of this opportunity, then you will receive 50% credit (i.e. if you deserved 20 points on your project part, but turned it in one class late, then you will get 10 points).

VI. Exams. One mid-term and one final exam will be held. The mid-term will be held on Thursday, Oct. 16, 2003. The final exam will be held on Tuesday, Dec. 16, 8-10am.

VII. Grading. Grades will be calculated in terms of the student's performance on:

1. Mid-Term (30%)
2. Final Exam (30%)
3. Programming Project (30%)
4. Homework (10%)

IX. Text Books: The required text is:

Clifford A. Shaffer. *A Practical Introduction to Data Structures and Algorithm Analysis*, 2nd Edition, Prentice Hall.

Other reference material will be indicated in class as the semester proceeds.

X. Instructor. Prof. V.S. Subrahmanian, vs@cs.umd.edu, 301-405-2711. Office Hours: Tuesdays and Thursdays from 10:45-11:30am (45 minutes immediately after the class). If you cannot make it at this time, please set up an appointment at another time by sending me email.

XI. Teaching Assistant. Tamer Nadeem (nadeem@cs.umd.edu, 301-405-2724). Office Hours: Monday and Friday, 11:30am - 12:30pm.