

# CMSC 420: Data Structures

Spring 2002

<http://www.cs.umd.edu/class/spring2002/cmcs420/>

## 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)
- Plane-Sweep and Rectangle Intersection Problems (2 lectures)
- Other selected data structures (5 lectures)

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

**III. Homeworks.** Between 3 and 5 homework assignments consisting of 3–5 problems each 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 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 Tuesday, March 12, 2002. The final exam will be held on Tuesday, May 21, 1:30-3:30pm.

**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.** Indrajit Bhattacharya, 4166 AVW, indrajit@cs, 301 405 2756. Office hours: Monday 2-3pm, Wednesday 12-1pm.