
CMSC 451 Syllabus Design and Analysis of Computer Algorithms Summer 2003

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Web Pages: <http://www.cs.umd.edu/class/sum2003/cmsc451/>

Course Overview: This course covers methods for analyzing and designing efficient computer algorithms, and P vs. NP-complete analysis.

Prerequisites: CMSC 214 & CMSC 351

Text: Cormen, Leiserson, Rivest, Stein Introduction to Algorithms--Second Edition

Grading:

2 Midterm Exams: 25% each		Best Midterm: 35%	[Whichever method gives the best overall grade. No makeup exams given.]
1 Final Exam: 35%	OR	1 Final Exam: 50%	
Homework: 15%		Homework: 15%	

Course Outline

351 Review Programming, Asymptotics, Recurrences, Sorting	1 Lecture
Sorting Algorithms (Chaps. 6-8) Comparison vs. Non-comparison Sorting Algorithms	1 Lecture
Binary Search Trees (Chaps. 12-13) Simple and Balanced	1 Lecture
Dynamic Programming (Chapt. 15) Matrix Chain Mult., Optimal Binary Search	Weeks 1 & 2
Greedy Algorithms (Chapt. 16). Knapsack problem, Huffman codes	Week 3
Graph Algorithms (Chaps. 22-24) Minimum Spanning Tree, Single-Source Shortest Paths, Rete Algorithm (optional)	Weeks 3 & 4
Linear Programming (Chapt. 29) Simplex Algorithm	1 Lecture
NP-Completeness (Chaps. 34-35) P and NP classifications, NP-complete problems, Polynomial Reductions (SAT, independent set, vertex cover, clique, Hamiltonian path, TSP), Techniques to cope with NPC problems.	Weeks 5 & 6

Policies

Homework is due (accepted) only at the beginning of class. You may discuss homework assignments however copied homework will not be graded. Exams are photocopied before they are returned to students. Attendance is noted and may impact final grade.