CMSC 451 Syllabus Design and Analysis of Computer Algorithms Summer 2003

Instructor: Dr. Ken Hennacy	Office 3251 AVW.	khennacy@cs.umd.edu	Phone: 5-4597
TA: Chiu Yuen Koo	Office 1151 AVW.	cykoo@cs.umd.edu	Phone: 5-2721

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.

Prerequisities: 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
1 Final Exam: 35%	OR	1 Final Exam: 50%	best overall grade. No
Homework: 15%		Homework: 15%	makeup exams given.]

Course Outline

351 Review — 1 Lecture
Programming, Asymptotics, Recurrences, Sorting

Sorting Algorithms (Chapts. 6-8) — 1 Lecture
Comparison vs. Non-comparison Sorting Algorithms

Binary Search Trees (Chapts. 12-13) — 1 Lecture
Simple and Balanced

Dynamic Programming (Chapt. 15) — Weeks 1 & 2
Matrix Chain Mult., Optimal Binary Search

Greedy Algorithms (Chapt. 16). — Week 3
Knapsack problem, Huffman codes

Graph Algorithms (Chapts. 22-24) — Weeks 3 & 4
Minimum Spanning Tree, Single-Source Shortest Paths, Rete Algorithm (optional)

Linear Programming (Chapt. 29) — 1 Lecture
Simplex Algorithm

NP-Completeness (Chapts. 34-35) — Weeks 5 & 6
P and NP classifications, NP-complete problems, Polynomial Reductions (SAT, independent set, vertex cover, clique, Hamiltonian path, TSP), Techniques to cope with NPC problems.

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.