UNIVERSITY OF CALIFORNIA, DAVIS Department of Computer Science

ECS 122B Advanced Algorithm Design and Analysis Spring 2001

Fact Sheet
Prerequisites: ECS 20, ECS 122A

Class Meets T, Th 9:00-10:20 in 1130 Hart
Discussion M 4:10-5:00 in 107 Cruess

Professor: Charles U. Martel 3049 Engineering II
Phone: 752-2651 email: martel@cs.ucdavis.edu
Office Hours: T 11:00-11:45
Th 1:10-2:00 and by appointment

TA: Dean Sniegowski 3090 Engineering II, email: sniegows@cs.ucdavis.edu

Class Web page:
http://www.cs.ucdavis.edu/~martel/122b

Web page for Programming Pearls: http://programmingpearls.com/

Grading: Homework (5 problem sets/programs) 25%
1 Midterm (2/5) 30%
Final 45%


Course Outline

A: Designing Efficient Programs: (chap 1-5 Programming Pearls), CLR 33.8:
   getting the problem right, Aha algorithms, program design/verification, Profiling and
   Testing programs, applied to primality testing and Binary Search.
   B: Advanced graph algorithms including matching and network flow algorithms. (Chapter
      27 in CLR)
   C: Estimating Performance: Chapter 6-7 PP.
   D: NP-Completeness: definition, problem reductions, strong NP-completeness, implications
      of NP-completeness, other complexity classes. (Chapter 36 in CLR)
   E: Algorithm Design Techniques: 8-10 PP (also 11 lightly)
   F: Approximation algorithms: examples, performance measures, analysis of special cases,
      polynomial approximation schemes. Implementations and study of approximation algo-
      rithms. (Chapter 37 in CLR)
   G: Sampling : Chapter 12 of Programming Pearls
   H: Strings : Chapter 15 of Programming Pearls
   I: Parallel Algorithms: Chapter 30 in Algorithms (if time permits)