

UNIVERSITY OF CALIFORNIA, DAVIS Department of Computer Science

ECS 122B Advanced Algorithm Design and Analysis Winter 2007

Tentative Course Outline

A: Designing Efficient Programs: (chap 1-5 Programming Pearls), CLRS 31.8: 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 26 in CLRS)

C: Estimating Performance: Chapter 6-7 PP.

D: NP-Completeness: definition, problem reductions, strong NP-completeness, implications of NP-completeness, other complexity classes. (Chapter 34 in CLRS)

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 algorithms. (Chapter 35 in CLRS)

G: Sampling : Chapter 12 of Programming Pearls

H: Strings : Chapter 15 of Programming Pearls

I: Parallel Algorithms: Chapter 30 in Algorithms (if time permits)