

CSE 102

Introduction to Analysis of Algorithms

Outline of Topics and Reading Schedule

- I. Lectures 1-5: Mathematical Preliminaries
 - Asymptotic Growth Rates (Handout, CLRS 3.1)
 - Common Functions (Handout, CLRS 3.2)
 - Induction Proofs (Handout)
 - Recurrence Relations (Handout, CLRS 4.1-4.6)
 - Graph Theory (Handout, CLRS B.4-B.5)

- II. Lectures 6-8: Divide and Conquer Algorithms
 - Searching, Sorting (CLRS 7)
 - Selection (CLRS 9)
 - Non-Comparison sorts (CLRS 8)
 - Strassen's Algorithm (CLRS 4.2)

- III. Lectures 9-11: Dynamic Programming (CLRS 15)
 - Coin Changing Problem (Brassard & Bratley 8.2)
 - Discrete Knapsack Problem (Brassard & Bratley 8.4)
 - Matrix Chain Multiplication (CLRS 15.2)
 - All-Pairs Shortest Paths Problem (CLRS 25)

- IV. Lectures 12-14: Greedy Algorithms (CLRS 16)
 - Continuous Knapsack Problem (Brassard & Bratley 6.5)
 - Minimum Weight Spanning Trees (CLRS 23)
 - Matroids (CLRS 16.4-16.5)

- V. Lectures 15-17: Lower Bounds and Computational Complexity
 - Decision Trees (CLRS 8.1)
 - Adversary Arguments (Handout)

- VI. Lectures 18-20: Ammortized Analysis
 - Fibonacci Heaps (CLRS 19)
 - Disjoint Sets (CLRS 21)