Algorithm Analysis and Design

BEG371CO

Year: III Semester: I

Teaching Schedule Hours/Week			Examination Scheme				
Theory	Tutorial	Practical	Internal		Final		Total
3	1	--	Theory	Practical	Theory	Practical	100
			20		80	-	

Course Objective:

After completing this subject, students will be able to explore techniques for designing and analyzing the algorithms.

1. Introduction **6 Hours**

1.1 Algorithm Definition
1.2 Algorithm Specification
  1.2.1 Pseudo code Convention
  1.2.2 Recursive Algorithms
1.3 Performance Analysis
  1.3.1 Space Complexity
  1.3.2 Time Complexity
  1.3.3 Asymptotic Notation (Ό, Ω)
  1.3.4 Practical Complexities
  1.3.5 Performance Measurement

2. Divide-And- Conquer **10 Hours**

2.1 General Method
2.2 Binary Search
2.3 Merge Sort, Quick Sort, Selection Sort
2.4 Strassen's Matrix Multiplication
2.5 Convex Hull

3. Greedy Method **6 Hours**

3.1 The General Method
3.2 Knapsack Problem
3.3 Job Sequencing with Deadlines
3.4 Minimum Cost spanning Trees
  3.4.1 Prim's Algorithm
  3.4.2 Kruskal's Algorithm
3.5 Dijkstra's Algorithm

4. Dynamic Programming **6 Hours**

4.1 The General Method
4.2 Multistage Graph

4.3 All Pairs Shortest Path
4.4 0/1 Knapsack
4.5 The Travelling Salesperson Problem

5. Backtracking **6 Hours**

5.1 General Strategy
5.2 8-Queens Problem
5.3 Kanpsack Problem
5.4 Graph Coloring
5.5 Hamiltonian Cycles

6. Branch and Bound **6 Hours**

6.1 General Strategy
6.2 0/1 Knapsack
6.3 Travelling Salesperson Problem

7. Np-Hard and Np-Complete Problems **5 Hours**

7.1 Basic Concepts
7.2 Np-Hard Graph Problems

References

1. Horowitz, Sahani and Rajasekaran "Fundamentals of Computer Algorithms", Galgotia Publication.
2. Bressard, "Fundamental of Algorithm.", PHI

Marks Distribution

Chapter	Marks
1	10
2	20
3	10
4	10
5	10
6	10
7	10
Total	80