B.TECH DEGREE PROGRAMME

SEMESTER IV
(2021 ADMISSIONS)

SYLLABUS

Rajagiri Valley, Kakkanad,
Kochi 682 039, Kerala, INDIA
www.rajagiritech.ac.in

COURSE CODE	COURSE NAME	L	T	P	CREDIT	YEAR OF INTRODUCTION
101009/IT422T	DESIGN AND ANALYSIS OF ALGORITHMS LAB	0	0	4	2	2021

1. Preamble

The syllabus is prepared with a view to equip the Engineering graduates to learn basic concepts in algorithms, and to instill the confidence to solve non-conventional problems using different problem solving strategies.

2. Prerequisite

101009/IT200C: Data Structures & Algorithms

101009/IT222T: Data Structures & Algorithms Lab

3. Syllabus

Implementation of Different Algorithms based on various algorithmic strategies using C/C++.

1. Time Space Trade off Implementation
2. Implement Minimum Spanning Tree algorithm – Prim's and Kruskal's(Greedy methodology)
3. Implement 0/1 Knapsack problem using Dynamic Programming.
4. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijikstra's algorithm.
5. Implement any scheme to find the optimal solution for the Traveling Salesperson problem and then solve the same problem instance using any approximation algorithm and determine the error in the approximation.
6. Implement N Queen's problem using Backtracking.
7. Print all the nodes reachable from a given starting node using the BFS method.
8. Check whether a given graph is connected or not using the DFS method.
9. Implement topological sort..

4. Text Books

1. E. Horowitz and S. Sahni , *Computer Algorithms*, second edition, Universities Press, 2007.
2. A. Aho, J. Hopcroft and J. Ullman ,*The Design and Analysis of Computer Algorithms*, First edition, Pearson publishers, 1974.

5. Reference Books

1. T. H. Cormen, C. E. Leiserson and R. L. Rivest, *Introduction to Algorithms*, 3rd Edition, The MIT Press, 2009.

2. S. Baase, Allen Van Gelder , *Computer Algorithms: Introduction to Design and Analysis*, 3rd Edition ,Pearson India, 1999.

3. D. E. Knuth, *The Art of Computer Programming*, Vol. 1, Vol. 2 and Vol. 3, Addison-Wesley, 2011.

4. Michael A. Nielsen & Isaac L. Chuang,*Quantum Computation and Quantum,* Cambridge University Press, 2010.

5. Richard Neapolitan, *Foundations of Algorithms* , 5th edition, Jones & Bartlett India Private Limited, 2015.

6. Course Outcomes

After the completion of the course the student will be able to:

CO 1:Analyze a given algorithm and express its time and space complexities in asymptotic notations.

CO 2: Solve recurrence equations using Iteration Method, Recurrence Tree Method and Master's Theorem.

CO 3: Solve Optimization problems using Greedy strategy, Dynamic strategy, Back Tracking and Branch Bound Techniques.

CO 4: Get an overview of Approximation and Randomized algorithms.

7. Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-
CO3	3	3	3	-	3	-	2	-	-	-	-	3
CO4	3	3	3	-	3	-	2	-	-	-	-	3

8. Mark Distribution

Total Marks	**Continuous Internal Evaluation (CIE)**	**End Semester Examination (ESE)**	**ESE Duration**
150	75	75	3hrs

9. Continuous Internal Evaluation Pattern

Attendance : 15 marks
Continuous Assessment : 30 marks
Internal Test (Immediately before the second series test) : 30 marks

10. End Semester Examination Pattern

The following guidelines should be followed regarding award of marks

(a) Preliminary work : 15 Marks

(b) Implementing the work/Conducting the experiment : 10 Marks

(c) Performance, result and inference : 25 Marks

(d) Viva voce : 20 marks

(e) Record : 5 Marks.

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