Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
ITL41	Design and Analysis of Algorithms Lab	-	-	2	-	-	1	1

ITL41	Design and Analysis of Algorithms Lab	Examination Scheme			
		ISE	ESE		Total
			Practical	Oral	
		40	10	10	60

Pre-requisite Course Codes	ES4 (Programming Methodology and Data structures) IT41 (Analysis of Algorithms)		
After successful completion of the course, student will be able to:			
Course Outcomes	CO1	Compare time and space complexity of different sorting and searching techniques	
	CO2	Solve various problems using dynamic programming approach	
	CO3	Illustrate the concepts of greedy approach	
	CO4	Demonstrate the applicability of backtracking, branch and bound strategies to solve problems in different domains	
	CO5	Demonstrate various string matching algorithms	

Exp. No.	Experiment Details (Implementation can be in C/C++ Language)	Ref.	Marks
1	Experiment on finding the running time of algorithm Selection sort Insertion sort	1,3	5
2	Experiment based on divide and conquer approach Merge sort Quick sort Binary search	2,3	5
3	Experiment on finding minimum and maximum numbers using divide and conquer approach	1	5
4	Experiment using dynamic programming approach Multistage graphs single source shortest path all pair shortest path 0/1 knapsack Travelling salesman problem Longest common subsequence	1,4	5
5	Experiment based on greedy approach Single source shortest path	1,5	5

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	Knapsack problem Job sequencing with deadlines Optimal storage on tapes		
6	Experiment on minimum spanning tree using Greedy approach	1,2,5	**5**
7	Experiment using Backtracking strategy 8 queen problem (N-queen problem) Sum of subsets Graph coloring, 15 puzzle problem Travelling salesman problem	2,3	**5**
8	Implement string matching algorithms The naïve string matching Algorithm The Rabin Karp algorithm The knuth-Morris-Pratt algorithm	1	**5**
		Total Marks	**40**

References:

1. T.H .Cormen, C.E. Leiserson, R.L. Rivest, C. Stein, "*Introduction to algorithms*", 3rd edition, PHI publication 2009.
2. Ellis Horowitz, Sartaj Sahni , S. Rajasekaran. "*computer algorithms*" 2nd edition, Computer Science Press, 1997
3. Sanjoy Dasgupta, Christos H. Papadimitriou, Umesh Vazirani, "*Algorithms*", 1st edition, Tata McGraw- Hill, 2006.
4. Jon Kleinberg, Eva Tardos, "*Algorithm Design*", 1st edition, Pearson, 2006.
5. Michael T. Goodrich, Roberto Tamassia, "*Algorithm Design and Application*", 1st edition ,Wiley Publication, 2015.