

Course Code	Course Title	L	T	P	C
BSTS302P	Advanced Competitive Coding – II	0	0	3	1.5
Pre-requisite	NIL	Syllabus version			
		1.0			
Course Objectives					
<ol style="list-style-type: none"> To deploy algorithms in real time applications. To develop the step by step approach in solving problems with the help programming techniques of data structures. 					
Course Outcomes					
At the end of the course the student should be able to					
<ol style="list-style-type: none"> Identify List, Stack based algorithms for solving real world problems. Illustrate various techniques for searching, sorting and hashing Understand and implement Dynamic Programming. Design new algorithms or modify existing algorithms for new application. 					
Module:1	Linked list	6 hours			
Loop Detection, Sort the bitonic DLL, Segregate even & odd nodes in a LL, Merge sort for DLL, Minimum Stack, The Celebrity problem.					
Module:2	Stack and Queue	6 hours			
Iterative Tower of Hanoi, Stock Span problem, Priority Queue using DLL, Sort without extra Space, Max Sliding Window Stack permutations					
Module:3	Trees	6 hours			
Recover the BST, Views of tree, Vertical order traversal, Boundary traversal.					
Module:4	Graphs	3 hours			
BFS, DFS, Dial's Algorithm, Bellman-Ford Algorithm					
Module:5	Heaps	3 hours			
Topological Sort, Heap Sort, Binomial heap, K-array heap Winner tree.					
Module:6	Maps, Sets and Hashing	6 hours			
HashMap to TreeMap, Types of Sets , Distributing items when a person cannot take more than two items of same type					
Module:7	Dynamic Programming	9 hours			
Longest Common Subsequence, Longest Increasing Subsequence, Longest Bitonic Subsequence, Longest Palindromic Subsequence, Subset sum problem, 0-1 Knapsack, Traveling Salesman, Coin Change, Shortest Common Super sequence, Levenshtein Distance problem , Rod Cutting problem, Wildcard pattern matching, Pots of gold game					
Module:8	Product Company Specific Interview Preparation -2	6 hours			
Operating Systems, Data Base Management Systems, Relational Data Base Management Systems.					
Total Lecture hours					45 hours
Text Book					
1.	Mark Allen Weiss, "Data structures and algorithm analysis in C++", 2019, 4th Edition, Pearson Education.				
Reference Books					
1.	J.P. Tremblay and P.G. Sorenson, "An Introduction to Data Structures with applications", 2017, Second Edition, Tata Mc Graw Hill.				
2.	Richard M. Reese, Jennifer L. Reese, Alexey Grigorev, Java: Data Science Made Easy, 2019 Pocket Publishing.				

Mode of Evaluation: Written Assignment, Quiz, Project & FAT.			
Recommended by Board of Studies	24-02-2023		
Approved by Academic Council	No.69	Date	16-03-2023