VIKASH INSTITUTE OF TECHNOLOGY, BARGARH

LESSON PLAN

Semester:4th		**Year: 2nd**	**Course: B.Tech**
Branch : CSE		**Sub: DESIGN AND ANALYSIS OF ALGORITHMS** **Sub Code : CSPC2006**	**Total Credit:03**
Name of the Faculty:		**ALINA KUMARI SWAIN**	
Designation :		**Assistant professor**	
Department :		CSE	
Session		**2024-25**	
Recommended Books		**Text book**: **T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Publication.** **A.V. Aho, J. E. Hopcroft and J.D. Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education.** **Reference Books**: **Computer Algorithms/C++, Ellis Horowitz, SatrajSahni and Rajasekaran, 2nd Edition, 2014, Universities Press.** **Introduction to the Design and Analysis of Algorithms, Anany Levitin: 2nd Edition, 2009. Pearson.**	
Sl. No.	**Lecture No.**	**Topics to be covered**	**No. of Classes**
		MODULE-1	
1	Lecture-01	Notion of Algorithm: Growth of functions	**8**
2	Lecture-02	Recurrences: The Master method	
3	Lecture-03	The Substitution method	
4	Lecture-04	The Iteration method	
5	Lecture-05	Asymptotic Notations and Basic Efficiency Classes (Use of Big O, θ, etc.) in analysis of algorithms	
6	Lecture-06	Mathematical Analysis of few Non-Recursive	
7	Lecture-07	Recursive Algorithms.	
8	Lecture-08	Asymptotic Notations	
		MODULE-2	
9	Lecture-09	Sorting and Searching Techniques	**10**
10	Lecture-10	Selection Sort, Bubble Sort, Insertion Sort and their analysis,	
11	Lecture-11	Sequential Search, Binary Search	
12	Lecture-12	Depth First Search and Breadth First Search	
13	Lecture-13	Balanced Search Trees, AVL Trees, Red-Black Trees	
14	Lecture-14	Heaps and Heap Sort	
15	Lecture-15	Disjoint Set and their Implementation	
16	Lecture-16	Divide and Conquer Paradigm of problem solving	
17	Lecture-17	Complexity analysis and understanding of Merge Sort	
18	Lecture-18	Quick Sort, Binary Search Trees	

		MODULE-3	
19	Lecture-19	Greedy Techniques: Prim's Algorithm	**9**
20	Lecture-20	Kruskal's Algorithm, Dijkstra's and Bellman Ford Algorithm	
21	Lecture-21	Huffman Trees, Knapsack problem	
22	Lecture-22	Dynamic Programming Paradigm: Floyd-Warshall Algorithm	
23	Lecture-23	Optimal Binary Search trees	
24	Lecture-24	Matrix Chain Multiplication Problem	
25	Lecture-25	Longest Common Subsequence Problem	
26	Lecture-26	0/1 Knapsack Problem	
27	Lecture-27	Maximum Network Flow Problem.	
		MODULE-4	
28	Lecture-28	String Matching Algorithms: Naive string-matching algorithm	**8**
29	Lecture-29	The Rabin-Karp Algorithm, string matching with Finite Automata	
30	Lecture-30	Knuth Morris Pratt string matching algorithm	
31	Lecture-31	Backtracking: n-Queen's problem	
32	Lecture-32	Hamiltonian Circuit problem	
33	Lecture-33	Subset-Sum problem	
34	Lecture-34	State Space Search Tree for these problems	
35	Lecture-35	kruskal,prim	
		MODULE-5	
36	Lecture-36	Branch and Bound: Travelling Salesman Problem and its State Space Search Tree.	**5**
37	Lecture-37	Introduction to Computability	
38	Lecture-38	Polynomial-time verification	
39	Lecture-39	NP-Completeness and Reducibility, NP- Complete problems	
40	Lecture-40	Approximation Algorithms: Vertex Cover Problem	

Signature of Faculty Member **Signature of HOD**

PRINCIPAL