



Code: CST208	Design and Analysis of Algorithms	Credit: 04
		L-T-P: (3-1-0)
Course Content	<p>Algorithm Analysis: Asymptotic notation, solution of recurrence, model of computation, time and space complexities, average and worst case analysis, Amortized analysis. Algorithm Design Techniques: Greedy algorithm, dynamic programming, divide and conquer, backtracking, branch and bound.</p> <p>Graph Algorithms: Shortest path algorithms, Disjoint set operations, minimum spanning tree algorithm, network flow, matching, coverings, applications of DFS:- bi-connectivity, Euler circuits, strongly connected components, topological sort, and articulation point. Matrix Algorithms – Strassen Matrix multiplication, LUP decomposition.</p> <p>Construction of codes: Shannon Fano and Huffman codes. Dynamic Programming: Chained matrix multiplication, longest common subsequence. Divide and Conquer: Order Statistics – finding the median, exponentiation, matrix multiplication, LCS. Computational Geometry: Line segments, Optimal polygon triangulation. Approximate Algorithm: Travelling Salesman Problem, vertex-cover problem.</p> <p>Primality testing, Integer factorization, Randomized algorithms, Probabilistic algorithms. String Matching algorithms: Rabin Karp, KMP, Boyer Moore.</p> <p>Introduction to problem classes – NP, NPC, NP-Hard.</p>	
Important Text Books/References	<ol style="list-style-type: none">1. Cormen, Leiserson, Rivest: Introduction to Algorithms, Prentice Hall of India.2. Horowitz and Sahani: Fundamental of Computer algorithms.3. Aho A.V , J.D Ulman: Design and analysis of Algorithms, Addison Wesley4. Brassard : Fundamental of Algorithmics, PHI.5. W.W. Peterson and E. J. Weldon: Error correcting codes.6. Sara Baase, Allen Van Gelder: Computer Algorithms: Introduction to Design and Analysis, Pearson Education	