4. Design and Analysis of Algorithms (CS-115) **(3-0-2)**

Growth of Functions, Summations, Recurrences, Design Techniques: Divide and conquer, Dynamic programming, Greedy algorithms, Backtracking, Branch and Bound, Graph Algorithms: Elementary graph algorithms, Single source shortest paths, All-pairs shortest paths, Maximum Flow, P and NP class problems, NP-completeness and reducibility, NP-completeness proofs, NP-complete problems, Polynomials and the Fast Fourier transform, Number-theoretic Algorithms, String matching, Algorithms for Parallel computers, Approximation algorithms etc.

References:

1. T Cormen, C Leisersson, R Rivest, C Stein, Introduction to Algorithms, PHI, 2003.

2. V. Aho, J. Hopcraft, J. Ulmann, The Design and Analysis of Computer Algorithms, Pearson Education, 2000.
3. E Horowitz, S Sahni, S Rajasekaran, Fundamentals of Computer Algorithms, Galgotia Publishers, 2010.
4. S. Basse, A. V. Gelder, Computer Algorithms: Introduction to Design and Analysis, Pearson Education Asia Pvt. Ltd., 2009.