

UGCBCS301: Algorithm Fundamentals (3-1-0)

Credit: 4

Marks:100 (Theory)

UNIT –WISE SYLLABUS

1 **Unit -1: Introduction to Computer Problem-Solving and Algorithms**

Introduction, the problem-solving aspect, Top-down design, Implementation of algorithms, program verification, Efficiency of algorithms, Analysis of algorithms. Introduction to Flowchart, Exchanging the values of two variables, Counting, Summation of a set of numbers, Factorial computation, Calculating Sin(X) and Cos(x) values, Reversing the digits of an integer.

2 **Unit -2: Factoring Methods**

Finding square root of a number, the smallest divisor of an integer, the greatest common divisor of two integers, Generating prime numbers, Raising a number to a large power, Computing the n^{th} Fibonacci number.

3 **Unit -3: Array Techniques**

Introduction to array, Array order reversal, Array counting, finding maximum number in a set, Removal of Duplicates from an ordered array, Partitioning of array, Finding K^{th} smallest element.

4 **Unit -4: Merging, Sorting and Searching**

Two way merge, Selection sort, Quick Sort, Insertion sort, linear search, Binary search.

Text Resources

1. Design and analysis of Algorithms
By Parag Dave and Himanshu Dave, Pearson Education.
2. How to solve by computer
By Dromey.

- R1. Introduction to Algorithm
By T Cormen, C Leiserson, PHI, 3rd Edition