# B.B.A.(C.A) Semester I 

Subject Code : - 107
Subject Name -: Principles of Programming and Algorithms
Total Contact Hours: -30
Total Credits: - 2

Pre requisite: Basic Mathematics.
Objectives: To develop Analytical / Logical thinking and Problem solving capabilities Credit Distribution: - 1 credit for theory ( 15 Lectures) and 1credit for Practical's.
Note: - Practical of PPA is on Computer fundamental and Scratch Programming.

| Unit No. | Contents | Lectures |
| :---: | :---: | :---: |
| 1 | Algorithm <br> 1.1 Concept: Problem, Algorithm. <br> 1.2 Characteristics of an algorithm. <br> 1.3 Examples <br> 1.3.1 Addition / Multiplication of integers <br> 1.3.2 Determining if a number is +ve / -ve, even / odd <br> 1.3.3 Maximum of 2 numbers, 3 numbers <br> 1.3.4 Sum of first $n$ numbers, sum of given $n$ numbers, Sum of digits of a given number, sum of first and last digit of a Number. <br> 1.3.5 Digit reversing, Table generation for number n , Factorial of a number, Prime number, Factors of a number, Perfect number, Palindrome number, Armstrong number, GCD And LCM of 2 numbers. | 6 |
| 2 | Flowchart <br> 2.1 Introduction <br> 2.2 Symbols <br> 2.3 Draw flowcharts for algorithms implemented in chapter 1. | 3 |
| 3 | Function <br> 3.1 Definition, Syntax. <br> 3.2 Introduction to Library functions : such as pow(),sqrt() etc <br> 3.3 Recursion <br> 3.3.1. Factorial of a number. <br> 3.3.2. Sum of digits of a given number. | 2 |
| 4 | Array <br> 4.1 Introduction <br> 4.2 Algorithms and Flowcharts using array <br> 4.2.1. Maximum and minimum element from an array <br> 4.2.2. Reversing elements of an array <br> 4.2.3. Mean and Median of $n$ numbers <br> 4.2.4. Row major and Column major representation of an array <br> 4.2.5. Sum of elements of an array <br> 4.2.6. Matrices: Addition, Multiplication, Transpose, Symmetry, upper/lower triangular | 4 |

## References:

| Sr. <br> No. | Title of the Book | Author/s | Publication |
| :---: | :--- | :--- | :--- |
| 1 | How to solve it by Computer | R. G. Dromy | Pearson |
| 2 | Fundamentals of Data <br> Structures | Horowitz and Sahani | Universities Press |
| 3 | Introduction to algorithms | Cormen, Leiserson, <br> Rivest, Stein | MIT Press |

