

**Course: Minor**  
**Principles of Programming and Algorithms**

<b>Semester: II</b>	<b>Credits: 2</b>	<b>Subject Code: BCMINPPA22301</b>	<b>Lectures: 30</b>
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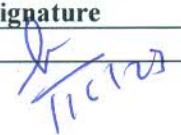
**Course Outcomes:**

At the end of this course the learner will be able to,

- CO1- Analyze the problem and find the logical solution.
- CO2-Analyze the basics of programming.
- CO3-Relate how to use programming in day to day application.
- CO4-Develop Analytical / Logical thinking and Problem solving capabilities.

<b>Unit 1: Algorithm and Flowchart</b>	<b>15</b>
<ul style="list-style-type: none"> <li>• Concept: Problem, Algorithm.</li> <li>• Characteristics of an algorithm.</li> <li>• Examples- Addition / Multiplication of integers , Determining if a number is +ve / -ve , even / odd, Maximum of 2 numbers , 3 numbers 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, 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</li> <li>• Managing I/O operations</li> <li>• Console based I/O and related built-in I/O functions</li> <li>• printf(), scanf()</li> <li>• getch(), getchar()</li> <li>• Formatted input and formatted output</li> <li>• Introduction</li> <li>• Symbols</li> <li>• Draw for the algorithms done.</li> </ul>	

<b>Unit 2: Function and Array</b>	<b>15</b>
<ul style="list-style-type: none"> <li>• Definition, Syntax.</li> <li>• Introduction to Library functions : such as pow(),sqrt() etc</li> <li>• Recursion</li> <li>• Factorial of a number. Sum of digits of a given number.</li> <li>• Introduction</li> <li>• Algorithms and Flowcharts using array</li> <li>• Maximum and minimum element from an array</li> <li>• Reversing elements of an array</li> <li>• Mean and Median of n numbers</li> <li>• Row major and Column major representation of an array</li> </ul>	

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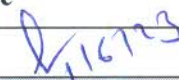
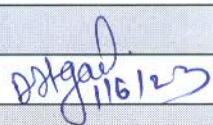
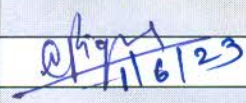
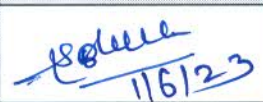
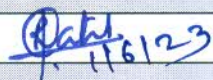
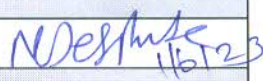
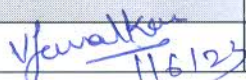
- Sum of elements of an array
- Matrices: Addition, Multiplication, Transpose, Symmetry, upper/lower triangular

**Recommended Text Books:**

- R. G. Dromy ,*How to solve it by Computer* ,Pearson
- Horowitz and Sahani ,*Fundamentals of Data Structures,-* Universities Press
- Cormen, Leiserson, Rivest ,*Introduction to algorithms*, Stein-MIT Press

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