

**JYOTI NIVAS COLLEGE AUTONOMOUS  
SYLLABUS FOR 2021 BATCH AND THEREAFTER  
PROGRAMME: BCA  
SEMESTER: I – PROBLEM SOLVING TECHNIQUES**

**NO. OF CREDITS: 3**

**NO. OF HOURS: 45**

**COURSE OUTCOMES (COS):**

1. Enable them to understand, analyze and develop the problem
2. Learn how to build by the algorithms for problems
3. Learn how to apply logic for problems.
4. Enable them to understand the syntax and also to solve the problems through C language
5. Enhance their programming skills.

**UNIT I**

**11**

**Hours**

**Introduction:** Programs and algorithm, The Role of Algorithms in Computing, Algorithms as a technology, analyzing algorithms, Designing algorithms, Growth of Functions, Asymptotic notation, Standard notations and common functions.

**Fundamental Algorithms:** Exchanging the values of two variables, Counting, Summation of a set of numbers, Factorial Computation, Generating of the Fibonacci sequence, Reversing the digits of an integer, Character to number conversion.

**UNIT II**

**12**

**Hours**

**C Programming:** Getting Started, Variables and Arithmetic expressions. Input and Output: Standard input and output, formatted output- printf, variable length argument list, formatted input-scanf.

**Control Flow:** Statements and Blocks, If-else, else-if, switch, loops: while loop, for loop, do while, break and continue, goto and labels.

**Functions** and category of functions, Pointers, Pointers and Arrays: pointers and address, pointers and function arguments, arrays, multidimensional array, initialization of pointer arrays, command line arguments.

**UNIT III**

**11**

**Hours**

**Factoring Methods:** Finding the square root of a number, the smallest Divisor of an integer, the greatest common divisor of two integers, computing the prime factors of an integer, raising a number to a large power.

**Array Techniques:** Array order Reversal, Finding the maximum number in a set, removal of duplicates from an ordered array, partitioning an array, Finding the kth smallest element, multiplication of two matrices.

**UNIT-IV**

**11**

**Hours**

**Merging:** the two-way merge, Sorting: Sorting by selection, sorting by exchange, sorting by insertion, sorting by diminishing increment, sorting by partitioning.

**Searching:** linear search, binary search, hash search. Text processing and Pattern searching: textline length adjustment, keyword searching in text, linear pattern search

**TextBooks:**

1. R.G.Dromey, "How to Solve it by Computer", Pearson Education India, 2008.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", 3<sup>rd</sup> Edition, The MIT Press Cambridge, Massachusetts London, England, 2008.
3. Brian M. Kernighan, and Dennis M. Ritchie, "The C Programming Language", 2<sup>nd</sup> Edition, Prentice Hall Software Series, 2012.

**ReferenceBooks:**

1. Steven S. Skiena, "The Algorithm Design Module", 2nd Edition, Springer-Verlag London Limited, 2008.
2. Donald E. Knuth, "The Art of Computer Programming", Volume 1: Fundamental Algorithms, 3rd Edition, Addison Wesley Longman, 1997.
3. Donald E. Knuth, "The Art of Computer Programming", Volume 2: Seminumerical Algorithms, 3rd Edition, Addison Wesley Longman, 1998.
4. Greg Perry and Dean Miller, "C Programming Absolute Beginner's Guide", 3rd edition, Pearson Education, Inc, 2014.