Chhattisgarh Swami Vivekananda Technical University, Bhilai

Semester: B.Tech – 2nd **Branch: Common to all Branches**
Subject: Programming for Problem Solving **Course Code: A000213(022)**
Total Marks in End Semester Exam: 100 **L: 3 T: 0 P: 0 Credits: 3**
Minimum number of Class tests: 02

Course Objectives:

- To learn the Computer Fundamental concepts
- To aware students about Problem Solving approach
- To make them to use basic components of Programming

Unit I: Introduction (4 lectures)

Introduction to Programming, Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.), Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart, Pseudo code and Source code with examples.

Unit II: Programming Concepts (9 lectures)

Variables, data types, memory locations, Syntax and Logical Errors in compilation, object and executable code, Arithmetic expressions and precedence, Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branching, Iteration and loops.

Unit III: Arrays (9 lectures)

Introduction to Arrays (1-D, 2-D), Character arrays and Strings, Basic Algorithms: Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs (no formal definition required).

Unit IV: Function (9 lectures)

Definition, prototyping, built in libraries, Parameter passing in functions, call by value, Passing arrays to functions: idea of call by reference, Recursion: Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc. Quick sort or Merge sort.

Unit V: Structure (9 lectures)

Defining structures and Array of Structures, Pointers: Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notion of linked list (no implementation), bit-fields.
File handling: concept of a file, text files and binary files, Formatted I/O, file I/O operations, example programs

Course Outcomes:

The student will learn-

- To formulate simple algorithms for arithmetic and logical problems.
- To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
- To use arrays, pointers and structures to formulate algorithms and programs.
- To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.

Text Books:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill

Reference Books:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India