II Semester
Course1: Problem Solving in C

Credits -3

I. LEARNING OUTCOMES: Upon successful completion of the course, a student will be able to:
1. Understand the functionality of a Digital Computer and fundamental constructs of programming. 2. Analyze and develop solutions to a given problem using control statements.
3. Work with arrays and textual information.
4. Understand the concept of functional hierarchical code organization. 5. Gain knowledge on derived data types and file handling.

UNIT I

Introduction to Computer and Programming:Introduction - Block diagram of a computer -Hardware and Software -Generations of Programming Languages – Algorithms - Flowcharts. Introduction to C: Introduction – Structure of C Program – Writing the first C Program – File used in C Program – Compiling and Executing C Programs – Using Comments – Keywords –Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C - Operators in C.

UNIT II

Decision Control and Looping Statements: Decision making statements: if, else if, else if ladder, switch statements; Loop Control Statements: while, do-while, for loop; break, continue and goto statements.

UNIT III

Arrays: Introduction – One Dimensional Arrays - Declaration, Initialization and Memory representation; Two Dimensional Arrays - Declaration, Initialization and Memory Representation;

Strings: Declaring and Initializing string variables, character and string handling functions.

UNIT IV

Functions: Introduction – Function declaration/ prototype – Function definition – function call – return statement – Categories of functions - Recursion - Parameter Passing techniques - Scope of variables – Storage Classes.

Pointers: Introduction to Pointers – declaring and initializing pointer Variables – accessing values using pointers - Pointer Arithmetic – Dynamic Memory Allocation.

UNIT V

Structures and Unions: Introduction – Structure definition - accessing structure members – Array of Structures - union definition – difference between structures and unions.

Files: Introduction to Files – Using Files in C – Reading Data from Files – Writing Data to Files – Detecting the End-of-file – Accepting Command Line Arguments.

III. REFERENCES:

TEXT BOOKS:

1. E Balagurusamy – Programming in ANSI C – Tata McGraw-Hill publications.
2. Computer fundamentals and programming in C, REEMA THAREJA, OXFORD UNIVERSITY PRESS

REFERENCE BOOKS:

1. Brain W Kernighan and Dennis M Ritchie - The ‘C’ Programming language - Pearson Publications.
2. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
3. YashavantKanetkar - Let Us ‘C’ – BPB Publications.

IV. SUGGESTED CO-CURRICULAR ACTIVITIES:

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside

the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
a. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
b. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

II Semester
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Credits -1

IV. PROBLEM SOLVING IN C – PRACTICAL

1. Write a program to find the area of circle and triangle.
2. Write a program to find simple and compound interest.
3. Write a program to convert temperature from Celsius to Fahrenheit
4. Write a program to find whether a number is even or odd
5. Write a program to find sum and average of 5 numbers
6. Write a program to check whether the given number is Armstrong or not.
7. Write a program to find the sum of individual digits of a positive integer.
8. Write a program to generate the first n terms of the Fibonacci sequence.
9. Write a program to find both the largest and smallest number in a list of integer values
10. Write a program to calculate factorial of given integer value using recursive functions
11. Write a program for addition of two matrices.
12. Write a program for multiplication of two matrices.
13. Write a program to perform various string operations.
14. Write a program to search an element in a given list of values.
15. Write a C program to write and read data into/from a File.