IPS Academy
Institute of Engineering and Science
Department of Computer Science and Engineering

ESC-CS01	Programming for Problem Solving	2L: 0T:0P (2hrs.)	2 Credits

Course Objective: To understand the programming concepts and build the logics according to given problems.

Course Content:

Module 1: Basics of C programming (11 hrs.)

History of C Language, Applications of C language, A Structure of C program. Data types, The C Character Set, Variables, Keywords, Constants ,C Instructions, Operators, Precedence and Associativity of Operators, Storage Classes in C, Introduction to Input/Output, Control statements and Jump Statements.

Module 2: Functions and Arrays (10hrs.)

Introduction to Functions, Function Declaration and definition, Function with Arguments, Function with Returning Values, Recursion. Arrays: Declaring and Initializing, 1- D array, Multi-Dimensional Arrays.

Module 3: Pointers and String (12 hrs.)

Pointers, Pointer variables, Pointer operators, Pointer Expressions, Pointer and arrays, Call by Value and Call by Reference, Passing Array to Functions, Passing strings to functions, Array of pointers, Pointer to an array, Pointers to Functions and its uses, dynamic memory allocation. Strings: Declaring and Initializing Strings, Operations on Strings, Array of Strings.

Module 4: Aggregate Data Types (8 hrs.)

Structures - Declaring and Initializing, Passing Structures to functions, Array of Structure, Array within Structures, pointers and structures, Uses of Structures. Unions, Enum.

Module 5: Files, Preprocessor Directives and Advance Topics (9 hrs.)

Files – File modes, File functions, and File operations, Text and Binary files, Command Line arguments.C Preprocessor directives, Creating and implementing user defined header files.

Course Outcome:

1. Understand the fundamental programming concepts of C language.
2. Implement C programs using functions and arrays.
3. Implement user defined data types like Pointer and Strings.
4. Demonstrate the ability to write C programs using structures, unions and Enum.
5. Understand the basics of file handling mechanism.

Textbooks/ References:

1. Kerninghan and Ritchie "The C programming language " 2nd Ed.,PHI,
2. Schildt "C: The Complete reference" 4thEd. TMH.
3. Kanetkar Y. " Let us C ", BPB Publications, 2004
4. Kanetkar Y.:" Pointers in C ",BPB Publications, 2007
5. Stephen Parata " C Primer Plus " 5thEd.,Sams, 2004
6. Paul Deitel and Harvey Deitel " C How to Program ", 6thEd.,Pearson, 2010

List of Experiments:

1. Write a C program to calculate the grade of the student according to the specified marks using if-else statement. (CO1)
2. Write a C program to implement break, goto and continue statements.(CO1)
3. Write a C program to swap the values of the two variables by using Call by value and Call by reference. (CO2)
4. Write a C program to find the average of n numbers using arrays.(CO2)
5. Write a C program to find the sum of two matrices of order 2*2.(CO2)
6. Write a C program to implement Pointer to an array.(CO3)
7. Write a C program to implement any 5 string functions. (CO3)
8. Write a C program to implement dynamic memory allocation functions (malloc(), calloc(),realloc(), free()). (CO3)
9. Write a C program to stores information of 5 employees and prints it using 'array of structures'. (CO4)
10. Write a C program to demonstrate the use of Enum. (CO4)
11. Write a C program to create a file, write contents in file, save and close the file. (CO5)
12. Write a C program to use command line arguments. (CO5)
13. Write a C program to create and implement user defined header file.(CO5)
14. Write a C program to display graphics.(CBS)
15. Write a C program to create and implement a tic-tac-toe game.(CBS)