PROGRAMMING IN C AND DATA STRUCTURES
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2015 -2016)
SEMESTER - I/II

Subject Code	15PCD13/23	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03

CREDITS - 04

Course objectives:

The objectives of this course is to make students to learn basic principles of Problem solving, implementing through C programming language and to design & develop programming skills. To gain knowledge of data structures and their applications.

Module -1 : INTRODUCTION TO C LANGUAGE	**Teaching Hours**
Pseudo code solution to problem, Basic concepts in a C program, Declaration, Assignment & Print statements, Data Types, operators and expressions etc, Programming examples and exercise. **Text 1:** Chapter 2, **and** **Text 2:** 1.1, 1.2, 1.3	**10Hours**
Module -2: BRANCHING AND LOOPING	
Two way selection (if, if-else, nested if-else, cascaded if-else), switch statement, ternary operator? Go to, Loops (For, while-do, do-while) in C, break and continue, Programming examples and exercises. **Text 1:** Chapter 3**.** **&** **Text 2:** 4.4.	**10 Hours**
Module – 3: FUNCTIONS, ARRAYS AND STRINGS	
ARRAYS AND STRINGS: Using an array, Using arrays with Functions, Multi-Dimensional arrays. String: Declaring, Initializing, Printing and reading strings, string manipulation functions, String input and output functions, array of strings, Programming examples and Exercises. **Text 1:** 5.7, & **Text 2**: 7.3, 7.4, chapter 9 **FUNCTIONS**: Functions in C, Argument Passing – call by value, call by reference, Functions and program structure, location of functions, void and parameter less Functions, Recursion, Programming examples and exercises. **Text 1:** 1.7, 1.8, Chapter 4. **Text 2:** 5.1 to 5.4.	**10 Hours**

Module-4: STRUCTURES AND FILE MANAGEMENT	
Basic of structures, structures and Functions, Array of structures, structure Data types, type definition, Defining, opening and closing of files, Input and output operations, Programming examples and exercises. **Text 1:** 6.1 to 6.3. **Text 2**: 10.1 to 10.4, Chapter 11.	**10 Hours**
Module-5: POINTERS AND PREPROCESSORS & Data Structures	
Pointers and address, pointers and functions (call by reference) arguments, pointers and arrays, address arithmetic, character pointer and functions, pointers to pointer ,Initialization of pointer arrays, Dynamic memory allocations methods, Introduction to Preprocessors, compiler control Directives, Programming examples and exercises. **Text 1:** 5.1 to 5.6, 5.8. **Text 2: 12.2,** 12.3**, 13.1 to 13.7**. **Introduction to Data Structures**: Primitive and non primitive data types, Abstract data types, Definition and applications of Stacks, Queues, Linked Lists and Trees. **Text 2 : 14.1, 14.2, 14.11, 14.12, 14.13, 14.15, 14.16, 14.17, 15.1**.	**10 Hours**

Course outcomes: On completion of this course, students are able to

- Achieve Knowledge of design and development of C problem solving skills.
- Understand the basic principles of Programming in C language
- Design and develop modular programming skills.
- Effective utilization of memory using pointer technology
- Understands the basic concepts of pointers and data structures.

Question paper pattern:

- The question paper will have ten questions.
- Each full Question consisting of 16 marks
- There will be **2** full questions(with a **maximum** of **four** sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer **5** full questions, selecting one full question from each module.

Text Books:

1. Brian W. Kernighan and Dennis M. Ritchie: The C Programming Language, 2nd Edition, PHI, 2012.
2. Jacqueline Jones & Keith Harrow: Problem Solving with C, 1st Edition, Pearson 2011.

Reference Books:

1. Vikas Gupta: Computer Concepts and C Programming, Dreamtech Press 2013.
2. R S Bichkar, Programming with C, University Press, 2012.
3. V Rajaraman: Computer Programming in C, PHI, 2013.