COURSE STRUCTURE

Course Code	**CSE1PF01A**				
Course Category	**Programming Foundation**				
Course Title	**Programming and Problem Solving**				
Teaching Scheme	**Lectures**	**Tutorials**	**Laboratory / Practical**	**Project**	**Total**
Weekly load hours	**02 hr/wk**	**--**	**02 hr/wk**	**--**	**04**
Credits	**02**	**--**	**01**	**--**	**03**
Assessment Schema Code	**TL4**				

Prerequisites:

- Introductory Knowledge of Computers.

Course Objectives:

1. Knowledge:

i. To understand the problem solving framework and approaches.

2. Skills:

i. To learn the Programming Language constructs.

3. Attitude:

To acquire programming skills for problem solving.

Course Outcomes:

After completion of this course students will be able to:

1. Develop efficient logic and algorithms for solving a problem.
2. Analyse the given problem and solve it using suitable programming constructs. 3. Apply programming skills for solving real world problems.

Course Contents:

Unit 1: Introduction of Computer System and Problem Solving:
Basics of Computers: Architecture, Processors, Memory, Number Systems, System Software - Operating system, Editor, Compiler, Assembler, Linker, Loader.

Unit 2: Introduction to Problem Solving:
Problem solving process/framework, Programming Paradigms: Imperative, Object Oriented, Functional and Logic programming. Characteristics of Programming Languages, Role of programming languages, need of studying programming languages.
Programming Design Tools: Algorithms, Pseudo-code and Flowchart, Case studies for Algorithm, Flowchart and Pseudocode. Top-Down and Bottom-Up design approach. Software Development Life Cycle.

Unit 3: Fundamentals of C
Introduction to C: Fundamentals of C-Programming, Data types, Constants, Variables, Operators, Expression, Pre-processor directives. Data Input and Output.

Control Structures: Structure of C program, Coding conventions, Decision making, Control Structures- Iterative, break and continue statements. Array- Single and Multidimensional arrays. Strings.

Unit 4: Functions and File Handling in C
Structure – Structure and Array of structure, Union.
Functions in C: User defined and Library functions. Different parameter passing methods (Call by Value and Call by Reference), String Library Functions, Recursion.
Pointers: Lifetime of Variables, Scope Rules: Static and Dynamic scope. Pointers
File Handling in C: File, Types of Files, File operations.

List of Assignments:

1. Write an algorithm and draw a flowchart to log in to Gmail account.
2. Write an algorithm and draw a flowchart to find the largest number among three numbers. 3. Write a menu driven program in C to implement the basic arithmetic operations. 4. Write a program in C to perform basic operations such as addition of two matrices. 5. Write a menu driven program in C to perform all string operations. (In built functions) 6. Write a C function to compute the factorial of a number with and without recursion. 7. Write a C program to accept student details and display their result using an array of structures. 8. Write a C function to swap two numbers using pointers.
9. Write a C program to copy contents of one file to another using File handling.
10. Write a C program to print the month-by-month calendar for the given year.

Learning Resources:

Text Books/ Reference Books:

1. Pradeep Sinha, Priti Sinha, "Computer Fundamentals", Eight edition, bpb publication. 2. Ramon Mata-Toledo, Pauline K. Cushman, "Introduction to Computer Science", Schaum's Outline series.
3. Herbert Schildt, "C: The Complete Reference", Fourth Edition, McGraw Hill Professional.
4. Yashwant Kanetkar, "Let us C", Nineteenth edition, bpb publication.

Supplementary Reading:

Web Resources:

Weblinks:

1. http://www.studytonight.com/c/overview-of-c.php
2. https://www.tutorialspoint.com/cprogramming
3. https://www.programiz.com/c-programming
4. https://www.cprogramming.com/

MOOCs:

1. https://archive.nptel.ac.in/courses/106/104/106104128/
2. https://archive.nptel.ac.in/courses/106/105/106105171/
3. https://nptel.ac.in/courses/106102066

Pedagogy:

- PowerPoint presentations
- Practical Demos
- Videos
- Online Classrooms
- Expert Lectures