Introduction to Programming

(Common to all Branches)

Course Code	**23ES1102**	**Year**	I	**Semester**	I
Course Category	Engineering Science	**Branch**	CE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Basic Mathematics
Continues Internal Evaluate:	30	**Semester End Exam:**	70	**Total Marks:**	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		
CO1	Describe the basics of Computer Programming and Problem Solving	**L2**
CO2	Apply programming constructs of C language to solve the problems	**L3**
CO3	Apply different data types like arrays, structures, unions, and pointers in implementing solutions to various problems.	**L3**
CO4	Analyze the given problem and use a modular programming approach to develop solutions.	**L4**

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	1												2	
CO2	3												2	
CO3	3												2	
CO4		2										1	2	

Syllabus		Mapped CO
Unit No.	**Contents**	
I	**Introduction to Programming and Problem Solving:** History of Computers, Basic organization of a computer: ALU, input-output units, memory, program counter, Introduction to Programming Languages, Basics of a Computer Program- Algorithms, flowcharts, pseudo code. Introduction to Compilation and Execution, Primitive Data Types, Variables, and Constants, Basic Input and Output, Operations, Type Conversion, and Casting. Problem solving techniques: Algorithmic approach, characteristics of algorithm, Problem solving strategies: Top-down approach, Bottom-up approach, Time and space complexities of algorithms.	**CO1**
II	**Control Structures:** Simple sequential programs Conditional Statements (if, if-else, switch), Loops (for, while do-while) Break and Continue.	**CO1, CO2**
III	**Arrays and Strings:** Arrays indexing, memory model, programs with array of integers, two dimensional arrays, Introduction to Strings.	**CO1, CO2, CO3**
IV	**Pointers & User Defined Data types:** Pointers, dereferencing and address operators, pointer and address arithmetic, array manipulation using pointers, dynamic memory allocation, User-defined data types- Structures, Unions.	**CO1, CO3, CO4**
V	**Functions & File Handling:** Introduction to Functions, Function Declaration and Definition, Function call Return Types and Arguments, modifying parameters inside functions using pointers, arrays as parameters, Recursion, Scope and Lifetime of Variables, Basics of File Handling.	**CO1, CO3, CO4**

Learning Resources
Textbooks
1. Programming in C, Reema Thareja, AICTE Edition, 2018, Oxford University Press 2. The C Programming Language, Brian W. Kernighan and Dennis M. Ritchie, Prentice-Hall, 1988
References
1. Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996 2. Computing fundamentals and C Programming, Bala Guruswamy, E., McGraw-Hill Education, 2008. 3. C Programming, A Problem-Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition
e- Resources and other Digital Material
1. https://www.geeksforgeeks.org/c-programming-language/ 2. https://www.greatlearning.in/academy/learn-for-free/courses/c-programming 3. https://onlinecourses.nptel.ac.in/noc22_cs101/course