

### Problem Solving and Programming

<b>Course Code</b>	19ES1102	<b>Year</b>	I	<b>Semester</b>	I
<b>Course Category</b>	Engineering Sciences	<b>Branch</b>	ME	<b>Course Type</b>	Theory
<b>Credits</b>	4	<b>L-T-P</b>	3-1-0	<b>Prerequisites</b>	Nil
<b>Continuous Internal Evaluation:</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

<b>Course Outcomes</b>	
Upon successful completion of the course, the student will be able to	
<b>CO1</b>	Develop algorithm and flowchart for simple problems.
<b>CO2</b>	Understand the structure, fundamentals and decision making statements in C.
<b>CO3</b>	Choose suitable iterative statements and arrays to solve the problems.
<b>CO4</b>	Solve problems using functions and pointers.
<b>CO5</b>	Apply the structures, unions and file operations in a specific need.

<b>Contribution of Course Outcomes towards achievement of Program Outcomes &amp; Strength of correlations (H:High, M: Medium, L:Low)</b>														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	M	M										L	L	M
CO2	L	L											L	M
CO3	M	M	M									L	L	M
CO4	M	M	M									L		L
CO5	M	M	M									L		L

<b>Syllabus</b>		
Unit No.	Contents	Mapped CO
I	Introduction to Computer Problem-Solving – Introduction, The Problem-Solving Aspect, Top-Down Design, Fundamental Algorithms – Exchanging the values of two variables, Counting, Summation of a Set of Numbers, Factorial Computation, Sine Function Computation, Generation of the Fibonacci Series. Basics of Flow charts.	CO1
II	<b>Introduction to C:</b> Introduction, Structure of C Program, A Simple C Program, C-Tokens, Basic Data types, Variables, Constants, Input / Output statements, Operators, Type conversion and Type casting. <b>Conditional Branching Statements:</b> if, if-else, if-else-if Statements and Switch case.	CO2
III	<b>Iterative Statements:</b> while, for and do - while loops, Nested loops, break and continue statements. <b>Arrays:</b> Declaration, Accessing array elements, Storing values, Operations on arrays, Multi-dimensional arrays. <b>Strings:</b> Introduction, String manipulation functions.	CO3
IV	<b>Functions:</b> Introduction, Using Functions, Function declaration, Function	CO4

	definition and Function call, Parameter passing, Passing arrays to functions, Recursion, Storage classes. <b>Pointers:</b> Declaration and Initialization of pointer variables, Pointer arithmetic, Pointers and arrays, Pointer to pointer, Array of pointers, Pointers and functions, Dynamic memory allocation.	
V	<b>Structures:</b> Introduction, Nested structures, Array of structures, Structures and functions, Unions. <b>Files in C:</b> Using Files in C, Read data from files, Writing data to files, Random access to files of records.	CO5

<b>Learning Resources</b>	
<b>Text Books</b>	
1. R.G. Dromey, How to Solve it by Computer, 1/e, Pearson Education, 2006. (for Unit I). 2. Reema Thareja , Programming in C, Oxford University Press, AICTE Edition, 2018.	
<b>Reference Books</b>	
1. B. A. Forouzan and R. F. Gilberg, Computer Science: A Structured Programming Approach Using C, 3/e, Cengage Learning, 2007. 2. Pradip Dey, Manas Ghosh, Programming in C, Oxford University Press, AICTE Edition, 3. B. Gottfried, Programming with C, 3/e, Schaum's outlines, McGraw Hill (India), 2017. 4. Jeri R. Hanly, Elliot B. Koffman, Problem Solving and Program Design in C, 5/e, Pearson.	
<b>e- Resources &amp; other digital material</b>	
1. <a href="http://cprogramminglanguage.net/">http://cprogramminglanguage.net/</a> 2. <a href="https://www.geeksforgeeks.org/c-programming-language/">https://www.geeksforgeeks.org/c-programming-language/</a> 3. <a href="https://nptel.ac.in/courses/106105085/4">https://nptel.ac.in/courses/106105085/4</a>	