C PROGRAMMING LAB

Course Code	20SA8553	Year	III	Semester	I
Course Category	Skill Advanced Course	Branch	ME	Course Type	Theory+ Lab
Credits	2	L – T – P	1 – 0 – 2	Prerequisites	Nil
Continuous Internal Evaluation	-	Semester End Evaluation	50	Total Marks	50

Course Outcomes: Upon successful completion of the course, the student will be able to

COs	Statement	Level
Course Outcomes (Theory Component)		
CO1	**Understand** the principles of structured programming and C constructs for solving problems.	L3
CO2	**Apply** suitable control constructs and array concepts to solve problems.	L3
CO3	**Apply** the concept of functions, pointers, and user defined data types to solve problems.	L3
Course Outcomes (Laboratory Component)		
CO1	**Apply** Structured Programming/C constructs for solving problems.	L3
CO2	**Implement** programs as an individual on different IDEs/ online platforms.	L3
CO3	**Develop** an effective report based on various programs implemented.	L6
CO4	**Apply** technical knowledge for a given problem and express with an effective oral communication.	L3
CO5	**Analyse** outputs using given constraints/test cases.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (H:High, M: Medium, L:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3											3		
CO2					3				3					
CO3										3				
CO4	3									3				
CO5		3												

Syllabus		
UNIT	**Course Content (Theory Component)**	**Mapped CO**
I	**Introduction to C:** 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	**CO1**
II	**Conditional Branching Statements:** if, if-else, if-else-if Statements and Switchcase **Iterative Statements:** while, do-while and for loops, break and continue statements.	**CO1, CO2**
III	**Arrays:** Declaration, accessing array elements, Storing values, Operations on arrays **Strings:** Introduction, String manipulation functions	**CO1, CO2**
IV	**Functions:** Introduction, Using Functions, Function declaration, Function definition and Function call, Parameter passing, Recursion, Storage classes. User defined data types: introduction to enum, introduction to typedef, introduction to structures, and introduction to union Declaration and Initialization of pointer variables, Pointer arithmetic, Pointers and arrays	**CO1, CO3**

V	**User defined data types:** introduction to Enum, introduction to typedef, introduction to structures, and introduction to union	**CO1, CO3**

Course Content (Laboratory Component)		
Expt. No	**Contents**	**Mapped COs**
I	Write a program to print sample strings like "hello world", "Welcome to C Programming" with different formats. Write a Program to print different data types in 'C' and their ranges. Write a Program to initialize, assignment & printing variables of different data types.	**CO1, CO2, CO3, CO4, CO5**
II	Write a Program to demonstrate arithmetic operators. (+,-,*,/,%) Write a Program to demonstrate logical operators.(logical AND, logical OR) Write a Program to read radius value from the keyboard and calculate the area of circle and print the result in both floating and exponential notation. Write a Program to calculate simple interest. Write a Program to convert temperature. (Fahrenheit – Centigrade and vice-versa)	**CO1, CO2, CO3, CO4, CO5**
III	Write a Program to read marks of a student in six subjects and print whether pass or fail (using if-else). Write a Program to calculate roots of quadratic equation (using if-else). Write a Program to perform arithmetic operations using switch case. Write a Program to display vowels and consonants using switch case	**CO1, CO2, CO3, CO4, CO5**
IV	Do the Following Programs Using for, while, do-while loops. Write a program to calculate sum of individual digits of a given number. Write a program to check whether given number is palindrome or not. Write a program to print prime numbers in the given range. Write a program to display multiplication tables from 1 to 10 except 3 and 5	**CO1, CO2, CO3, CO4, CO5**
V	Write a program to print the Fibonacci series for given 'N' value. Write a program to check whether a given number is a Fibonacci number or not. Write a program to read 2 numbers x and n then compute the sum of the Geometric Progression. 1+x+ x2 +x3 + +x^n	**CO1, CO2, CO3, CO4, CO5**
VI	Write a program to store 10 elements in the 1-D array and print sum of the array. Write a program to print minimum and maximum elements in the 1-D array. Write a program to count no. of positive numbers, negative numbers and zeros in the array	**CO1, CO2, CO3, CO4, CO5**
VII	Write a program to perform various string manipulations using built-in functions. Write a program to verify the given string is palindrome or not(without built-in functions, with using built-in functions). Write a program to concatenate two strings using arrays.	**CO1, CO2, CO3, CO4, CO5**
VIII	Write a program to find sum of two numbers using functions. Write a program to swap two numbers using Call By Value Write a program to calculate factorial using recursion and non- recursion functions.	**CO1, CO2, CO3, CO4, CO5**
IX	Write a program to swap two numbers using Call By Reference Write program to perform arithmetic operations using pointer. Write a program matrix addition using pointers	**CO1, CO2, CO3, CO4, CO5**
X	Write a program to display a day associated with a number using enum(assume Sunday=0 to Saturday=6). Write a program to create structure and union for an account holder in a bank with	**CO1, CO2, CO3,**

	following Fields: name, account number,address, and balance and display the details of five account holders. Write a program to alias int with integer, char with character, float with flt and double with dbl using typedef.	**CO4, CO5**

Learning Resources
Text Books:
1. Programming in C, ReemaThareja, AICTE Edition, 2018, Oxford University Press.
Reference Books:
1. Computer Science: A Structured Programming Approach Using C, B. A.Forouzan and R.F. Gilberg, Third Edition, 2007, Cengage Learning. 2. Programming in C, PradipDey, ManasGhosh, AICTE Edition, OxfordUniversity Press. 3. Programming with C, B. Gottfried, Third Edition, 2017, Schaum'soutlines, McGraw Hill. 4. Problem Solving & Program Design in C,Jeri R. Hanly,Ellot B. Koffman,5th Edition, Pearson.
E-Resources & other digital Material:
1. http://cprogramminglanguage.net/ 2. https://www.geeksforgeeks.org/c-programming-language/ 3. https://www.greatlearning.in/academy/learn-for-free/courses/c- programming 4. https://www.udemy.com/course/the-complete-c-programming/ 5. https://nptel.ac.in/courses/106/105/106105171/