PROGRAMMING FOR PROBLEM SOLVING LAB

II Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
A5CS02	ESC	-	-	3	1.5	30	70	100

COURSE OBJECTIVES:

1. To be familiarize with flowgorithm to solve simple problems
2. To develop programs to solve basic problems by understanding basic concepts in C like operators, control statements etc.
3. To develop modular, reusable and readable C Programs using the concepts like functions, arrays, strings, pointers and structures.

LIST OF EXPERIMENTS

Week - 1 INTRODUCTION TO FLOGORITHM

a. Installation and working of Flowgorithm Software.
b. Write and implement basic arithmetic operations using Flowgorithm – sum, average, product, difference, quotient and remainder of given numbers etc.

Week - 2 FLOWGORITHM - OPERATORS AND EVALUATION OF EXPRESSIONS

a. Draw a flowchart to calculate area of Shapes (Square, Rectangle, Circle and Triangle).
b. Draw a flowchart to find the sum of individual digits of a 3 digit number.
c. Draw a flowchart to convert days into years, weeks and days.
d. Draw a flowchart to read input name, marks of 5 subjects of a student and display the name of the student, the total marks scored, percentage scored.

Week - 3 FLOWGORITHM –CONDITIONAL STATEMENTS

a. Draw a flowchart to find roots of a quadratic equation.
b. Draw a flowchart to find the largest and smallest among three entered numbers and also display whether the identified largest/smallest number is even or odd
c. Draw a flowchart to check whether the triangle is equilateral, isosceles or scalene triangle

Week - 4 OPERATORS

a. Write a C program to swap values of two variables with and without using third variable.
b. Write a C program to enter temperature in Celsius and convert it into Fahrenheit.
c. Write a C program to calculate Simple and Compound Interest.
d. Write a C program to calculate s = ut+(1/2)at^2 where u and a are the initial velocity in m/sec (= 0) and acceleration in m/sec^2 (= 9.8 m/s^2)).

Week - 5 CONDITIONAL STATEMENTS

a. Write a C program to find largest and smallest of given numbers.
b. Write a C program which takes two integer operands and one operator form the user(+,-,*,/,% use switch)
c. Write a program to compute grade of students using if else adder. The grades are assigned as followed:

marks<50	F
50≤marks< 60	C
60≤marks<70	B
70≤marks	B+
80≤marks<90	A
90≤mars≤ 100	A+

Week - 6	LOOPING STATEMENTS

a. Write a C program to find Sum of individual digits of given integer
b. Write a C program to generate first n terms of Fibonacci series
c. Write a C program to generate prime numbers between 1 and n
d. Write a C Program to find the Sum of Series SUM=1-x2/2! +x4/4!-x6/6!+x8/8!-x10/10!
e. Write a C program to generate Pascal's triangle.
f. Write a C program to generate pyramid of numbers.

Week - 7	ARRAYS

a. Write a C Program to implement following searching methods
    i. Binary Search
    ii. Linear Search
b. Write a C program to find largest and smallest number in a list of integers
c. Write a C program
    i. To add two matrices
    ii. To multiply two matrices
d. Write a C program to find Transpose of a given matrix

Week - 8	FUNCTIONS

a. Write a C program to find the factorial of a given integer using functions
b. Write a C program to find GCD of given integers using functions
c. Write a C Program to find the power of a given number using functions

Week - 9	RECURSION

a. Write a C Program to find binary equivalent of a given decimal number using recursive functions.
b. Write a C Program to print Fibonacci sequence using recursive functions.
c. Write a C Program to find LCM of 3 given numbers using recursive functions

Week - 10	STRINGS

a. Write a C program using functions to
    a. Insert a sub string into a given main string from a given position
    b. Delete n characters from a given position in a string
b. Write a C program to determine if given string is palindrome or not

Week - 11	POINTERS

a. Write a C program to print 2-D array using pointers
b. Write a C program to allocate memory dynamically using memory allocation functions (malloc, calloc, realloc, free)

Week - 12 **STRUCTURES**

a. Write a C Program using functions to
   i. Reading a complex number
   ii. Writing a complex number
   iii. Add two complex numbers
   iv. Multiply two complex numbers
   Note: represent complex number using structure

b. Write a C program to read employee details employee number, employee name, basic salary, hra and da of n employees using structures and print employee number, employee name and gross salary of n employees.

TEXT BOOKS:

1. Riley DD, Hunt K.A. Computational Thinking for the Modern Problem Solver. CRC press, 2014 Mar 27.
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)
3. Yashavant Kanetkar, "Let Us C", BPB Publications, New Delhi, 13th Edition, 2012.

COURSE OUTCOMES

At the end of the course, student will be able to

1. Solve simple mathematical problems using Flowgorithm.
2. Correct syntax errors as reported by the compilers and logical errors encountered at run time
3. Develop programs by using decision making and looping constructs.
4. Implement real time applications using the concept of array, pointers, functions and structures.
5. Solve real world problems using matrices, searching and sorting