

PROGRAMMING IN C LAB

Course Title	Programming in C Lab	Course Code	CS-108 (Common to all CSE AND ALLIED BRANCHES)
Semester	I-Year	Course Group	Practical
Teaching Scheme in Periods(L:T:P)	0:0:3	Credits	2
Methodology	Lecture + Practical	Total Contact Hours	90
CIE	60 Marks	SEE	40 Marks

Prerequisites

Knowledge of basic mathematics and IT skills.

Course Content and Blue Print of Marks for SEE

Sno	Course Name	Hours/ Periods	Marks for SEE			Marks weightage	%Weightage
			Coding	Execution	Viva		
1	Programming in C Lab	90	20	10	10	40	100
	Total	90	40			40	100

Course Outcomes

Upon completion of the course the students shall be able to:

Course Outcome	
CO1	Develop Algorithms and draw flow charts for given problems
CO2	Develop programs to demonstrate data types and operators
CO3	Develop programs using Decision making and looping statements
CO4	Develop programs to create arrays and know usage of strings
CO5	Develop programs to demonstrate Modular Programming using Functions
CO6	Develop programs using Structures, Unions, and Files.

Course Contents:

CO	Description	Periods
CO1	Develop Algorithms and draw flow charts for given problems	9
CO2	Develop programs to demonstrate data types and operators	9
CO3	Develop programs using Decision making and looping statements	15
CO4	Develop programs to create arrays and know usage of strings	18
CO5	Develop programs to demonstrate Modular Programming using Functions	18
CO6	Develop programs using Structures, Unions, and Files.	21
	Total	90

TEXT BOOKS

1. Let Us C -- Yeshwanth Kanetkar BPB Publications
2. Programming in ANSI C -- E. Balaguruswamy Tata McGrawHill
3. Programming with C -- Gottfried Schaum' outline
4. C The complete Reference -- Schildt Tata McGraw Hill

Reference Books

1. The C Programming Language- Brian W. Kernighan, Dennis M. Ritchie - Publication Prentice Hall
2. Programming in C 3rd Edition-Sams Publishing- Steven G. Kochan- Sams Publishing
3. Expert C Programming: Deep Secrets-Peter Van Der Linden- Pearson Publications
4. C Programming: A Modern Approach. K.N. King- Norton Publications
5. Learn to Program with C- Noel Kalicharan- APress Publications

Suggested e-Learning Links

1. https://www.w3schools.com/c/c_intro.php?external_link=true
2. <https://www.geeksforgeeks.org/c-programming-language/>
3. <https://www.programiz.com/c-programming>
4. <https://www.javatpoint.com/c-programming-language-tutorial>

5. <https://www.freecodecamp.org/news/the-c-programming-handbook-for-beginners/>
6. <https://www.tutorialspoint.com/cprogramming/index.htm>
7. <https://www.codecademy.com/catalog/language/c>
8. <https://www.codechef.com/learn/course/c>
9. <https://archive.nptel.ac.in/courses/106/104/106104128/>
10. <https://www.youtube.com/watch?v=3QiItnIWmOM>
11. <https://www.digimat.in/nptel/courses/video/106105171/L01.html>
12. <https://www.digimat.in/nptel/courses/video/106105171/L07.html>

Suggested Learning Outcomes (List of Exercises)

Upon completion of the course, the student shall be able to

CO1 - Develop Algorithms and Draw Flow Charts For Given Problems

DURATION:9 PERIODS

1. Write an algorithm and flowchart to find the sum and average of N numbers.
2. Write an algorithm and flowchart to check whether a given number is even or odd.
3. Write an algorithm and flowchart to find the largest of three numbers.
4. Write an algorithm and flowchart to calculate simple interest.

CO2 - Develop Programs to demonstrate data types and operators

DURATION:9 PERIODS

5. C Program to declare variables of different data types (int, float, double, char) and display their sizes using sizeof.
6. C Program to calculate the area of a circle taking radius as integer but area as float using typecasting.
7. C Program to swap two numbers without using a temporary variable.
8. C Program to find the perimeter and area of a rectangle using arithmetic operators.
9. C Program to calculate the simple interest using arithmetic operators.

CO3 - Develop programs using Decision making and looping statements

DURATION:15 PERIODS

10. C program to print natural numbers from 1 to N using for loop.
11. C program to find the factorial of a number using while loop.
12. C program to generate Fibonacci series using do-while loop.
13. C program to check whether a number is palindrome using loops.
14. C program to check whether a number is prime.
15. C Program to find the profit or loss based on given cost price and selling price.
16. C Program to find whether a year is a leap year.
17. C Program to calculate the grade of a student based on given marks of a subject.
A: ≥ 90 , B: 80–89, C: 70–79, D: 60–69, F: < 60
18. Find the type of triangle (Equilateral, Isosceles, Scalene) based on side lengths.
19. C Program to count the number of digits in a number.
20. C Program to find the sum of digits of a number.
21. C Program to reverse a number.
22. C program to Keep accepting numbers from the user until they enter 0, then display the sum of those entered numbers.

CO4 - Develop programs to create arrays and know usage of strings

DURATION:18 PERIODS

23. C program to read and print elements of a one-dimensional array.
24. C Program to find the sum and average of elements in an array.
25. C program to find the largest and smallest elements in an array.
26. C program to perform addition of two matrices.
27. C program to perform multiplication of two matrices.
28. C program to sort array elements in ascending order.
29. C program to find transpose of a matrix of size 3x3.
30. C Program to count the number of even and odd elements in an array.
31. C Program to compare two strings without using strcmp().
32. C Program to find the frequency of each character in a string.
33. C program to check whether a string is a palindrome.

CO5 - Develop programs to demonstrate Modular Programming using Functions

DURATION:18 PERIODS

34. C program to demonstrate user-defined functions (with arguments and return value).
35. C program to find GCD and LCM of two numbers using functions.
36. C program to demonstrate recursive function (factorial or Fibonacci).
37. C program to convert temperature from Celsius to Fahrenheit using functions.
38. C program to count the number of vowels in a string passed as a parameter using functions.

39. C Program that calculates area, perimeter, and diagonal of a rectangle using three separate functions.
40. C Program to demonstrate functions without argument and without return value.
41. C Program to demonstrate functions with argument and without return value.
42. C Program to demonstrate functions without argument and with return value.
43. C Program to demonstrate functions with argument and with return value.

CO6 - Develop programs using Structures, Unions, and Files

DURATION:21 PERIODS

44. C program to perform string operations (length, copy, concatenate).
45. C program to check whether a given string is a palindrome.
46. C program to count vowels, consonants, digits, and spaces in a string.
47. C program to store and display student information using structures.
48. C program to demonstrate array of structures.
49. C program to demonstrate the difference between structure and union.
50. C program to write data to a text file.
51. C Program to read and display content from a file.
52. C Program to count the number of words and lines in a file.
53. C Program to append text to an existing file.
54. C Program to copy contents from one file to another.
55. C Program to Search for a specific word in a file and display its occurrence.
56. C Program to create a binary file and write 10 integers into it.
57. C Program to read all the integers from the binary file using random access.
58. C program to develop a simple student record system using files with the following structure. And perform modification and deletion operations given student rollNo.

```
struct Student {  
    int rollNo;  
    char name[20];  
    float marks;  
};
```
59. Create a binary file of 20 integers. Read every alternate record and display it.
60. Copy all even numbers from a binary file to another file using random access.

Suggested Student Activities

1. Slip Test on small snippets.
2. Implementation of different application of real time exercises which are beyond the exercises.
3. Implementation of simple projects solving real world problems(Ex:- Addition of two n-digit numbers etc)

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	
CO1	3	2	1			1	2	1,2,3,6,7
CO2	3	2	1			1	2	1,2,3,6,7
CO3	3	2	2	1		2	2	1,2,3,4,6,7
CO4	3	2	2	1		2	2	1,2,3,4,6,7
CO5	3	2	2	1		2	2	1,2,3,4,6,7
CO6	3	2	1	1		3	2	1,2,3,4,6,7