

Semester: II
Subject Name: Computer Programming
Subject Code: 09CE1104

Objective: This Course will help to develop programming skills in the students, using a structured programming language 'C'. Students will learn stepped procedure of any program development process using flowchart and algorithms. The programming skill will help to work with advance level programming languages which in turn will be helping in developing programs for the scientific, research and business purposes.

Credits Earned: 4 Credits

Course Outcomes: After completion of this course, student will be able to

- Recognize importance of C language.
- Consider problems logically through flow charts and algorithms.
- Illustrate various programming syntax.
- Analyze the various control structures that requires to use in real time applications
- Convert real time applications into algorithms and device the program using C language notations.
- Established basic programming principles using C language.
- Categorizes various loops in C language.

Pre-requisite course: NA.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
2	0	4	4	50	30	20	25	25	150

Contents:

Unit	Topics	Contact Hours
1	Introduction: Problem solving using flowchart and algorithm, Flowchart-Importance of flowchart, Symbols of flowchart, how to prepare flowchart, Algorithm design, Pseudo code	4
2	Basic of C language: History of C, Structure of C program, compilation and execution, 'C' tokens, character set, Data Types, Keywords, Identifiers, constants & variables, declaring and assigning value to variable, operators, Input and output function, Type conversion and type casting	6
3	Decision statements & looping: Decision making statements, simple If statement, If-else, nested If-else, else-if ladder, switched statement, goto statement Looping statements, simple for loop, nested for loop, while & do-while loop	5
4	Array and String: Types of array, declaration & initialization of 1-D array, operation in array String- declaration & initialization, string functions, string arrays	4
5	Function: Definition of function, Built-in-function- Math function, console & standard i/o function, user defined function, recursion	3
6	Structure & Union: Definition of structure, need of structure, declaration of structure, array within structure, structure within structure, structure and union difference	3
7	Pointer: Pointer-definition, importance of pointers, declaration & initialization of pointer, accessing the address of a variable through pointers, pointer & array, pointer & string	2
8	File management: Introduction, file management functions, opening and closing a file, Input/ Output operations on files, error handling during I/O operations, Random Access to file	2
	Total Hours	29

References:

1. Balagurusamy. E, “Programming in ANSI C”, Tata McGraw Hill, Sixth edition, 2012.
2. Ashok N Kamthane, “Computer Programming”, Pearson education, Second Impression, 2008.
3. Kanetkar Yashavant, “Let us 'C'”, BPB publications, fourth revised edition.
4. Reema Theraja, “Programming in C”, Oxford University Press, First Edition, 2011.

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
35%	35%	30%	0%	0%	0%

Suggested List of Experiments:

1. Write a program to print student detail.
2. Write a program to calculate simple interest.
3. Write a program that accepts centigrade and convert it into Fahrenheit.
4. Write a program that accepts two numbers in A and B interchange value of A and B variable.
5. Write a program to demonstrate the use of Arithmetic and Bitwise operators by getting two numbers from the user.
6. Write a program that accepts a number from keyboard and find whether the number is ODD or EVEN using Conditional operators.
7. Write a program that accepts three numbers from the user and print maximum of them.
8. Write a program to input the Name and the Salary of an Employee. Calculate and print the Name, Salary and Bonus of the Employee, where bonus= 5.3% if salary is at least Rs. 10,000 and 6.5% otherwise.
9. Admission to professional course is subject to the following conditions.

Marks in Mathematics>=60

Marks in Physics>=50

Marks in Chemistry >= 40

Total in all three subjects >= 200 or total in mathematics and physics >= 150

Given the marks in the three subjects, Write a program to process the application to list the eligible candidates.

10. Write a program that accepts two numbers and one code (1,2,3,4) from the user. According to the code, the operations to be performed, using switch case statements as follows: (Code : 1 → Addition, 2 → Subtraction, 3 → Multiplication, 4 → Division).
11. Write a program that reads the marks for five subjects of a student. Calculate and print the grade for the student [i.e. Grade A,B,C,D and F] using Else-If ladder.
12. Write a program that do $\text{sum} = 1+3+5+\dots+N$ terms Print value of Sum.
13. Write a program to print the Fibonacci Series [i.e 1,1,2,3,5,8,13...N terms].
14. Write a program to accept one number from the user. i) Display reverse of that number. ii) Find if it is Armstrong or not.
15. Write a program that accepts a number from the user and print prime numbers from 0 to that number.
16. Write a C program to display following different Patterns.

1 1 2 1 2 3 1 2 3 4	1 0 1 1 0 1 0 1 0 1
A B C D E F	a b c d e f

17. Write a program to accept 5 numbers in an array and display it.
18. Write a program to accept 9 numbers in form of matrix and display in matrix form.
19. Write a program to accept 5 numbers in array and find maximum and minimum value of it.
20. Write a program to sort all elements of 1-D array in ascending and descending order.

21. Write a program to calculate and display addition of two matrixes.
22. Write a program to count number of vowels in a given string.
23. Write a program to check whether entered string is palindrome or not.
24. Write a program to demonstrate the Library function for string.
25. Write a function which receives number as argument and return sum of digit.
26. Write a program to calculate Factorial using recursion in UDF.
27. Write a program to calculate total number of positive, negative and zero value in array using UDF.
28. Write a program to swap two numbers using UDF and pointer.
29. Write a program using pointer to read in an array of integers and print its elements in reverse order.
30. Write a C program to create a structure of employees with Full Name, Last Name, City and Salary.
Display it for n employees.
31. Write a program to demonstrate nested structure.(make structures for circle and rectangle)
32. Write a program to create array of structure. Make a structure for student having student_no, student_name, student_marks and enter details for 5 students.
33. Write a program to Display contents of a file on screen. Use functions (fopen, fclose, getc, putchar, eof)
34. Write a program to count number of characters in a file.

Instructional Method:

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory