INSTITUTE	**DIPLOMA STUDIES**
PROGRAM	**DIPLOMA ENGINEERING (COMPUTER ENGINEERING)**
SEMESTER	**2**
COURSE TITLE	**COMPUTER PROGRAMMING**
COURSE CODE	**09CE2104**
COURSE CREDITS	**4**

Objective:

1 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.

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

1 Apply the fundamental concepts of C language to solve basic programming problems
2 Construct logical solutions using flowcharts and algorithms for given problem scenarios
3 Implement appropriate C programming syntax to develop functional code
4 Use suitable control structures, loops to address specific real-time application requirements
5 Translate real-world problems into algorithms and develop corresponding C programs
6 Apply basic programming principles to design structured and modular C programs

Pre-requisite of course:N/A

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	4	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Flowchart & Algorithm** Problem solving using flowchart and algorithm, Flowchart-Importance of flowchart, Symbols of flowchart, how to prepare flowchart, Algorithm design, Pseudo code	4
2	**Fundamentals of C** History of C, Structure of C program, compilation and execution, Compiler and Interpreter, 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

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Contents : Unit	Topics	Contact Hours
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	4
4	**Array, String & Pointer** Types of arrays, declaration & initialization of 1-D array, operation in array, String- declaration & initialization, string functions, string arrays, Pointer-definition, importance of pointers, declaration & initialization of pointer, accessing the address of a variable through pointers, pointer & array, pointer & string	6
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	**File management** Introduction, file management functions, opening and closing a file, Output operations on files,, error handling during I/O operations, Random Access to file	2
Total Hours		**28**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Practical-1** Make a Flowchart and Algorithm for swap two numbers using temporary variable and without using temporary variable.	2
2	**Practical-2** Make a Flowchart and Algorithm to represent a bank account (Contains name of the depositor, account number, type of account and balance amount in the account) for the process like to deposit an amount, to withdraw an amount after checking the balance.	2
3	**Practical-3** Write a C program that accepts temperature in Celsius, Fahrenheit, or Kelvin and converts it into the other two units.	2
4	**Practical-4** Write a program to demonstrate the use of Arithmetic and Bitwise operators by getting two numbers from the user.	1
5	**Practical-5** Write a program to perform basic arithmetic operations/ mathematical operations like calculators on user inputted data.	2
6	**Practical-6** Write a program that accepts three numbers from the user and print maximum of them.	1

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
7	**Practical-7** 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.	1
8	**Practical-8** 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. Assign marks for the three subjects. Write a program to process the application to list the eligible candidates.	2
9	**Practical-9** 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).	2
10	**Practical-10** 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.	2
11	**Practical-11** Write a program that do sum=1+3+5+……. N terms and sum=2+4+6+…..... N terms Print value of Sum.	2
12	**Practical-12** Write a program to print the Fibonacci Series [i.e 1,1,2,3,5,8,13…N terms].	1
13	**Practical-13** Write a program to accept one number from the user. i) Display reverse of that number. ii) Find if it is Armstrong or not.	1
14	**Practical-14** Write a C program to display different Patterns.	3
15	**Practical-15** Write a program to accept 5 numbers in an array and display it.	1
16	**Practical-16** Write a program to accept 9 numbers twice in form of matrix to display in matrix form and perform Addition of them.	2
17	**Practical-17** Write a program to accept 5 numbers in array and find maximum and minimum value of it.	1
18	**Practical-18** Write a program to sort all elements of 1D & 2D array in ascending and descending order.	2

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
19	**Practical-19** Calculate the average, geometric and harmonic mean of n elements in an array.	2
20	**Practical-20** Write a program to calculate and display multiplication of two matrixes	1
21	**Practical-21** Write a program to count number of vowels in a given string.	1
22	**Practical-22** Write a program to check whether entered string is palindrome or not	1
23	**Practical-23** Write a program to demonstrate the library function for string.	2
24	**Practical-24** Create a function that converts amount into words. (i.e. 1234: One Thousand Two Hundred Thirty-Four).	2
25	**Practical-25** Write a program that calculates the factorial of number using both iterative and recursive functions.	2
26	**Practical-26** Write a function which receives number as argument and return sum of digit.	1
27	**Practical-27** Write a program to calculate Factorial using recursion in UDF.	1
28	**Practical-28** Write a program to calculate total number of positive, negative and zero value in array using UDF.	1
29	**Practical-29** Write a program to swap two numbers using UDF and pointer.	2
30	**Practical-30** Write a program using pointer to read in an array of integers and print its elements in reverse order.	1
31	**Practical-31** Write a C program to create a structure of employees with Full Name, Last Name, City and Salary. Display it for n employees.	2
32	**Practical-32** Write a program to demonstrate nested structure. (make structures for circle and rectangle)	2
33	**Practical-33** 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.	2

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
34	**Practical-34** Write a program to Display contents of a file on screen. Use functions (fopen, fclose, getc,putchar,eof)	2
35	**Practical-35** Write a program to count number of characters in a file.	1
Total Hours		**56**

Textbook :

1 Programming with ANSI and Turbo C, Ashok N. Kamthane, Pearson Education, 2008

References:

1 Programming in ANSI C, Programming in ANSI C, E. Balagurusamy, McGraw Hills Education, 2024

2 Let us 'C', Let us 'C', Yashavant Kanetkar, BPB Publication, 2024

3 Introduction to C Programming, Introduction to C Programming, Reema Thareja, Oxford University Press, New Delhi, 2015

Suggested Theory Distribution:

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

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
35.00	35.00	30.00	0.00	0.00	0.00

Instructional Method:

1 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.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory

4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

Supplementary Resources:

1 http://nptel.ac.in/courses/106104128/

2 http://nptel.ac.in/courses/106106133/

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Supplementary Resources:

3 http://vlab.amrita.edu/index.php

4 http://ocw.mit.edu/courses/electrical-engineering-and-computer- science/6-087-practicalprogramming-in-c-january-iap-2010/

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