# 20CS12P3 - C PROGRAMMING LABORATORY

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| **Course Category:** | Professional Core | **Credits:** | 1.5 |
| **Course Type:** | Practical | **Lecture - Tutorial - Practical:** | 0-0-3 |
| **Prerequisite:** | Knowledge on computer fundamentals and basic mathematics. | **Sessional Evaluation:**  **Univ. Exam Evaluation:**  **Total Marks:** | 40  60  100 |
| **Objectives** | * To learn the C programming constructs and its implementation | | |

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| **Course Outcomes** | Upon successful completion of the course, the students will be able to Solve problems using C programming concepts. |
| **Course Content** | 1. Familiarization with computer hardware and programming environment, concept of naming the program files, storing, compilation, execution and debugging. Taking any simple C- code.    1. Develop a Program to read length and breadth of a rectangle and find out area and perimeter.    2. Develop a Program to read 3 sides of a triangle and find out area of a triangle.    3. Develop a Program to read principle amount, rate of interest, time. Find out Compound Interest. 2. An electricity board charges the following rates for the use of electricity: for the first 200 units 80 paise per unit: for the next 100 units 90 paise per unit: beyond 300 units Rs 1 per unit. All users are charged a minimum of Rs. 100 as meter charge. If the total amount is more than Rs 400, then an additional surcharge of 15% of total amount is charged. Write a program to read the name of the user, number of units consumed and print out the charges. 3. Write a C program that uses functions to perform the following operations:    1. Reading a complex number    2. Writing a complex number    3. Addition of two complex numbers    4. Multiplication of two complex numbers 4. Implement using functions to check whether the given number is prime and display appropriate messages. (No built-in math function). 5. Develop a Program to compute Sin(x) using Taylor series approximation. Compare your result with the built- in Library function. Print both the results with appropriate messages. 6. Implement structures to read, write, compute average- marks and the students scoring above and below the average marks for a class of N students. 7. Implement Recursive functions for Binary to Decimal Conversion. 8. The total distance traveled by vehicle in‘t’ seconds is given by distance = ut+1/2at2 where ‘u’ and ‘a’ are the initial velocity (m/sec.) and acceleration (m/sec2). Write C program to find the distance traveled at regular intervals of time given the values of ‘u’ and ‘a’. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of ‘u’ and ‘a’. 9. Write a C- Program that Uses Functions to insert a Sub-String in to a Given Main String from a Given Position. 10. Write a C -program to construct a pyramid of numbers. 11. Write a C- program to read in two numbers, x and n, and then compute the sum of this geometric progression:   1+x+x2+x3+x4+……….+xn  Print x, n, the sum  Perform error checking. For example, the formula does not make sense for negative exponents- if n is less than 0. Have your program print an error message if n<0 then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.   1. Write a C- program for finding the 2’s complement of a binary number 2. Write a C program to convert a Roman numeral to its decimal equivalent. 3. Write a C program which copies one file to another. 4. Develop a program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of n real numbers. |
| **Text Books and References** | Text Books:   1. Programming with ANSI & TURBO C by Ashok N.Kamthane, Pearson Education 2007. |
| Reference Books:   1. A Book on C by Al Kelley/Ira Pohl, Fourth Edition, Addison-Wesley.1999 2. Let Us C by Yashvant Kanetkar, BPB Publications. 3. Programming in ANSI C by Balaguruswamy 6th Edition, Tata McGraw Hill Education, 2012. |
| **E-Resources** | 1. <https://nptel.ac.in/courses> 2. <https://freevideolectures.com/university/iitm> |