

<b>COURSE TITLE</b>	<b>INTRODUCTION TO COMPUTER PROGRAMMING</b>
<b>COURSE CODE</b>	<b>01CT1101</b>
<b>COURSE CREDITS</b>	<b>4</b>

**Objective:**

- 1 In this basic course, we will move through a number of introductory C concepts, such as basic syntax, looping, arrays, pointers, and elementary functions and data types. The course will also aim to stimulate students into thinking like programmers and provide an understanding of programming techniques that reaches beyond familiarity and basic fluency with the C programming language.

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

- 1 Understand Flowchart, Algorithms and Pseudocode that helps to develop logical base of any problem statement
- 2 Understand the usage of different primitive, derived and user defined datatypes.
- 3 Analyse the use of different conditional and looping control statements in a complex problem.
- 4 Apply the knowledge of decisional control statements to deal with pre-processors, macros, pointers and file management to enhance the coding skills.
- 5 Apply overall programming knowledge that brings the solution of real-world problems/ use cases

**Pre-requisite of course:** Zeal to explore problem solving skill

**Teaching and Examination Scheme**

<b>Theory Hours</b>	<b>Tutorial Hours</b>	<b>Practical Hours</b>	<b>ESE</b>	<b>IA</b>	<b>CSE</b>	<b>Viva</b>	<b>Term Work</b>
3	0	2	50	30	20	25	25

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>Introduction to c language</b> Pseudo code solution to problem,, problem solving using flowchart and algorithm, Basic concepts in a C program, Structure of 'C' program statements, Data Types, operators and expressions , Type Conversion and Type Casting,, Programming examples and exercises	6
2	<b>Branching and looping</b> Two-way selection (if, if-else), nested if-else, cascaded if-else, switch statement,, ternary operator? Go to, For, while-do, do-while in C, break and continue, Programming examples and exercises	6

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
3	<b>Arrays and strings</b> Using an array, Using arrays with Functions, Multi- Dimensional arrays, String: Declaring, Initializing, Printing, and reading strings, string manipulation functions, String input and output functions, array of strings,, Programming examples and Exercises.	6
4	<b>Functions &amp; pointers</b> Functions in C, Argument Passing , call by value, call by reference, Functions and program structure, location of functions, void, and parameter less Functions, Recursion, Programming examples and exercises., Introduction to Pointers, Pointers as Function Parameter, Pointer, Arithmetic, Pointers and Arrays, Function Pointers, Programming examples and exercises.	8
5	<b>Structure, union &amp; file management</b> Need of Structure, Basic of structures, structure declaration and definition, structures and Functions, Array of structures, structure Data types, type definition, Union declaration and definition, structure vs union, Introduction to file management and its functions, opening and closing of files, Input and output operations, Programming examples and exercises	6
6	<b>Preprocessors &amp; data structures</b> Dynamic memory allocations methods, Introduction to Preprocessors, compiler control Directives, Introduction to Data Structures: Primitive and non-primitive data types, Abstract data types, Stacks, Queue, Linked Lists , Trees	6
7	<b>Application Level Programming</b> Implementation of Projects using C programming	4
<b>Total Hours</b>		<b>42</b>

### Suggested List of Experiments:

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>Experiment 1</b> Write a program to print student detail., Write a program to calculate simple interest., Write a program that accepts centigrade and convert it into Fahrenheit., Write a program that accepts two numbers in A and B interchange value of A and B variable., Write a program to demonstrate the use of the basic data types int, char and float.	2
2	<b>Experiment 2</b> Write a program to demonstrate the use of Arithmetic operators by getting two numbers from the user, Write a program that accepts a number from keyboard and find whether the number is ODD or EVEN using Conditional operators., Write a program to demonstrate the use of increment and decrement operator., Write a program to demonstrate the use of shorthand operators, Write a program to demonstrate the use of sizeof() of operator., Write a program to demonstrate the use of bitwise operators.	2

**Suggested List of Experiments:**

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
3	<b>Experiment 3</b> Write a program that accepts three numbers from the user and print maximum of them., Demonstrate the use of GOTO statement., 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., Admission to professional course is subject to the following conditions. Marks in Mathematics $\geq$ 60, Marks in Physics $\geq$ 50 Marks in Chemistry $\geq$ 40, Total in all three subjects $\geq$ 200 or total in mathematics and physics $\geq$ 150, Given the marks in the three subjects, write a program to process the application to list the eligible candidates.	2
4	<b>Experiment 4</b> 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)., 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., Write a program that do sum=1+3+5+ ..... N terms Print value of Sum., Write a program to print the Fibonacci Series [i.e. 1,1,2,3,5,8,13...N terms]., Write a program to accept one number from the user., Display reverse of that number., Find if it is Armstrong or not.	2
5	<b>Experiment 5</b> Write a program that accepts a number from the user and print prime numbers from 0 to that number., Write a C program to display various Patterns., Write a program to accept 5 numbers in an array and display it., Write a program to accept 9 numbers in form of matrix and display in matrix form., Write a program to accept 5 numbers in array and find maximum and minimum value of it.	2
6	<b>Experiment 6</b> Write a program to accept 5 numbers in array and find maximum and minimum value of it., Write a program to sort all elements of 1-D array in ascending and descending order., Write a program to calculate and display addition of two matrix., Write a program to count number of vowels in a given string., Write a program to check whether entered string is palindrome or not.	2
7	<b>Experiment 7</b> Write a program for string concatenation without using library function., Write a program to demonstrate the Library function for string., Write a function which receives number as argument and return sum of digit., Write a program for calculating Fibonacci series using UDF and call by value, Write a program to calculate Factorial using recursion in UDF.	2

### Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
8	<b>Experiment 8</b> Write a program to find Average, maximum and minimum of Array elements using UDF., Write a program to calculate total number of positive, negative and zero value in array using UDF.	2
9	<b>Experiment 9</b> Write a program to swap two numbers using UDF and pointer.	2
10	<b>Experiment 10</b> Write a program using pointer to read in an array of integers and print its elements in reverse order.	2
11	<b>Experiment 11</b> Write a C program to create a structure of employees with Full Name, Last Name, City and Salary. Display it for n employees., Write a program to demonstrate nested structure. (make structures for circle and rectangle)	2
12	<b>Experiment 12</b> Write a program to create array of structure. Make a structure for student having student_no, student_name, student_marks., Write a program to create union cricketer having player_name, batting_avg, player_age.P for swapping of two values with help of UDF and call by reference., Write a program to Display contents of a file on screen. Use functions (fopen,fclose, getc,putchar,eof), Write a program to count number of characters in a file.	2
<b>Total Hours</b>		<b>24</b>

### Textbook :

- 1 Programming in ANSI C, E. Balagurusamy, Tata Mcgraw-Hill Publishing Com, 2014
- 2 Programming in C, , Pradip Dey & Manas Ghosh , Oxford Publication , 2011

### References:

- 1 C How to Program, C How to Program, Paul Deitel, Harvey Deitel, Pearson, 2015
- 2 C: Programming Language, C: Programming Language, Ritchie Dennis M, Kernighan Brain W, Prentice Hall Of India Private limited, 1988

### 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
10.00	15.00	30.00	15.00	15.00	15.00

**Instructional Method:**

- 1 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 2 Practical examination will be conducted at the end of the semester for evaluation of performance of students in laboratory.
- 3 Students may use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory, etc.
- 4 The course delivery method will depend upon the requirement of content and need of the students. The teacher in addition to conventional teaching method (Chalk and Talk) may use any of the tools such as demonstration, role play, Quiz, brainstorming, Flipped class, Project based learning, Collaborative learning, MOOCs etc. for effective teaching.

**Supplementary Resources:**

- 1 <http://nptel.ac.in/courses/106105085/4>
- 2 <http://nptel.ac.in/courses/106104128>
- 3 <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-087-practical-programming-in-c-january-iap-20>