

Subject Code: 1ET1100105	Subject Title: Programming in C
Pre-requisite	---

Course Objective:

This course is intended to demonstrate the importance and develop problem solving skills in students with basics of C Language programming constructs. Students are expected to learn problem solving using algorithm & flowchart techniques, analyze the problem and implement the most appropriate method to solve the problem using 'C' programming. Through this Students learn the Concepts of Basic Programming languages like loop, array, structure and will be able to learn other advanced programming languages like Java, C++ etc.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	1	2	5	70	30	30	20	150

Subject Contents			
Sr. No	Topic	Total Hours	Weight (%)
1	Problem Solving Techniques: What is Problem Solving? Always have a pen, restate the Problem, Divide the Problem, Start with what you know, reduce the Problem, Look for Analogies, Experimental Approach Algorithm: Introduction, Syntax/Semantics. Writing Techniques. Algorithm writing with simple problems. Importance of Algorithms. Flowchart: Definition and Importance of Flowchart, Flowchart Symbols, Guidelines for preparing flowchart, Flowchart Structures – Sequence, Selection, Repetition	9	18
2	Basic Introduction of Programming in C: BasicHistory of C, Features of C, Introduction to Programming in C, General Structure of "C" Program. Standard Header files. C Tokens, Keywords and Identifiers, Constant and variables in C. Variables (Declaration, Initialization, Dynamic, Basic IO Operation in C Initialization), Data Types, Conversions (Explicit-Implicit Conversions), Debugging C Program. Write your first C program.	5	10
3	Operators in C: Types of operators and their symbolic representation, Arithmetic operators, Comma and conditional/turnery operator, Increment/Decrement operator, Relational operators, Assignment operators and expressions, Logical operators, Bitwise operators, Properties of operator, Priority of operator and their clubbing	4	08
4	Manage & Formatting Input /Output: Reading and Writing Characters and Strings, Formatted Input and Formatted Output	4	06
5	Decision Making/Branching Statements: Conditional Statements: if statement, if-else statement, Nested if-else statement, if-else-if ladder statement, switch statements, Conditional Operator. Unconditional branching: goto statement.	6	16
6	Looping in C: Introduction to Looping Structures, Types of Loops, for loop, while loop, do while loop, for loop, nesting of loops, use of break and continue statement	8	16
7	Fundamentals of Arrays: Introduction to Arrays, Types of Arrays, Characteristics of Array, Array declaration, Array initialization, Accessing array elements, Sorting / Searching operations on array elements, Two dimensional declaration and initialization, String operation using built in String functions.	6	14

8	Functions in C: Introduction to User defined function (UDF), Function declaration, Function definition, Function call, Categories of function, Nesting of function, Recursion, functions with arrays, the scope, visibility and lifetime of variables in functions.	6	12
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Course Outcome:

At the end of this course, the student would be able

- To understand the methods of problem solving and have fundamental knowledge on flowcharts and algorithms to formulate the problem.
- To write, compile and debug programs in C language
- To study, analyze and understand logical structure of a computer program, and different programming construct to develop a program in 'C' language
- To design simple and complex programs involving decision structures, loops and functions

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	To understand the methods of problem solving and have fundamental knowledge on flowcharts and algorithms to formulate the problem.	2. Understanding
CLO2	To write, compile and debug programs in C language	4. Analyze 5. Evaluate
CLO3	To study, analyze and understand logical structure of a computer program, and different programming construct to develop a program in 'C' language	2. Understanding
CLO4	To design simple and complex programs involving decision structures, loops and functions	3. Applying, 2. Understanding
CLO5	To design simple and complex program with using array and structure	2. Understanding
CLO6	To design program using function of various types	6. Creating

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	M	L	L						M		L		H			L
CLO2	M	L	L						H				M			M
CLO3	M	L	L						M		H		H			H
CLO4	M	L	L						M		H				H	

CLO5	M	L	M				H					H			L	
CLO6	M	L	L						M			L				M

H: High, M: Medium, L: Low

List of Book References:

1. Programming in ANSI C – E Balagurusamy, TMH publication.
2. Let us “C” – KanetkarYashwant, BPB Publication.
3. Think Like a Programmer- V. Anton Spraul ,No starch Press

E-Resources / Web Links

1. https://books.google.co.in/books?id=r6XiBUBERG8C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
2. <http://www.cprogramming.com/>
3. <https://www.w3schools.com/c/index.php>
4. <https://www.javatpoint.com/c-programming-language-tutorial>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Sr. no.	Practical Exercise
1	1 FOX, Goose and Cone Puzzle 2 Sliding Puzzle
2	Draw a Flowchart and write an Algorithm for Following Problems. 1 Write an algorithm and draw a flowchart for converting centimeters to meters. 2 Write an algorithm and draw a flowchart for finding maximum from 3 numbers. 3 Write an algorithm and draw a flowchart for finding sum of N Numbers. 4 Write an algorithm and draw a flowchart to find the factorial of given number.
3	Usage of Operators (Part-I) 1 Write a C program to print “Hello C!” 2 Write a C program to demonstrate Simple calculations. 3 Write a C program for demonstrating constant. 4 Write a C program to use symbolic constant. 5 Write a C Program that demonstrates implicit and explicit conversion. 6 Write a C Program to swap two numbers.
4	Usage of Operators (Part-II) 1 Write a C Program to make Simple Calculator. 2 Write a C Program to Solve Quadric equation. 3 Write a C Program to convert days in to month and year. 4 Write a C program to make simple grade sheet which makes total of given subjects marks and find percentage. 5 Write a C Program to find simple interest. 6 Write a C Program to Calculate Area of • Circle , Rectangle , Square

5	Decision Making/Branching Statements 1 Write a C Program to check given number is even or odd. 2 Write a C Program to find maximum and minimum of three numbers. 3 Write a C Program to check weather year is leap year or not. 4 Write a C Program to find given number is negative, positive or zero. 5 Write a C Program to make choice based Simple Calculator. 6 Write a C Program to demonstrate forward and backward jump using goto statement. 7 Write a C Program to demonstrate ATM transaction (money withdrawal). 8 The distance between two cities (In KM) is input through key board. Write a program to convert and print this distance in meters, feet, inches¢imetres.																									
6	Looping Structures 1 Write a program to display multiplication table. 2Write a program to find sum of all integers greater than 100 & less than 200 and are Divisible by 5. 3 Write a program to evaluate following series. • 1+2+3+4+5+.....+N • 1+3+5+7+.....+N • 1-2+3-4+5-6+.....+N • 1 + 1/2 + 1/3 + 1/4 +.....+ 1/N • 1²+ 2²+ 3²++ N² 4 Write a C Program to find factorial numbers using Loop. 5 Write a C Program to reverse given numbers. 6 Write a C program to (a) count digits (b) find sum of digits of a given number. 7 Write a C program to convert each digits of a number in words 8Write a C program to print Fibonacci series of given range 9 Write a C program to prepare a currency converter. 10 Write a c program to check given number is perfect number or not 11 Write a c program to check given number is Armstrong number or not 12 Write a c program to check given number is Prime number or not 13 Write a c program to check given number is Palindrome number or not 14 Write a C program for following pattern. <table><tr><td>*</td><td>12345</td><td>1</td><td>1</td><td>AAAAA</td></tr><tr><td>**</td><td>1234</td><td>22</td><td>12</td><td>BBBB</td></tr><tr><td>***</td><td>123</td><td>333</td><td>123</td><td>CCC</td></tr><tr><td>****</td><td>12</td><td>4444</td><td>1234</td><td>DD</td></tr><tr><td>*****</td><td>1</td><td>55555</td><td>12345</td><td>E</td></tr></table>	*	12345	1	1	AAAAA	**	1234	22	12	BBBB	***	123	333	123	CCC	****	12	4444	1234	DD	*****	1	55555	12345	E
*	12345	1	1	AAAAA																						
**	1234	22	12	BBBB																						
***	123	333	123	CCC																						
****	12	4444	1234	DD																						
*****	1	55555	12345	E																						
7	Arrays 1 Write a C Program to make sum of 10 numbers using an Array. 2 Write a C Program to find maximum of given array elements. 3 Write a C Program to make addition of two arrays' elements. 4 Write a C Program to scan and print two dimensional array elements. 5 Write a C Program to search an element from an array. 6 Write a C Program to sort array elements in ascending and descending order. 7 Write a C Program to delete specific element from array elements. 8 Write a C Program to make matrix multiplication of two 3*3 matrixes.																									
8	Functions 1 Write a C Program and make Function to Convert Fahrenheit to Celsius. 2 Write a C Program and make Function to Find Sum and Average of three Numbers. 3 Write a C Program and Make Function for each operation of Simple Calculator. 4 Write a C Program and make recursive function for Factorial. 5 Write a C Program and that demonstrate use of nesting of Function.																									