Lovely Professional University, Punjab

Course Code	Course Title	Lectures	Tutorials	Practicals	Credits	
CSE101	COMPUTER PROGRAMMING	2	0	2	3	
Course Weightage	ATT: 5 CA: 25 MTT: 20 ETT: 50	**Exam Category: 11: Mid Term Exam: All MCQ – End Term Exam: All MCQ**				
Course Focus	EMPLOYABILITY,SKILL DEVELOPMENT					

Course Outcomes :Through this course students should be able to

CO1 :: discuss the various approaches towards solving a particular problem using the C language constructs

CO2 :: write programs to solve different problems using C constructs irrespective of the compilers

CO3 :: plan the process of code reuse by forming a custom library of one's own functions

CO4 :: complete the understanding and usage of one of the building blocks of data structures namely pointers

CO5 :: categorize the theoretical knowledge and insights gained thus far to formulate working code

CO6 :: validate the underlying logic and formulate code which is capable of passing various test cases

	TextBooks (T)		
Sr No	**Title**	**Author**	**Publisher Name**
T-1	PROGRAMMING IN C	ASHOK N. KAMTHANE,	Pearson Education India

	Reference Books (R)		
Sr No	**Title**	**Author**	**Publisher Name**
R-1	PROGRAMMING IN ANSI C	E. BALAGURUSAMY	Tata McGraw Hill, India
R-2	C HOW TO PROGRAM	PAUL DEITEL AND HARVEY DEITEL	Pearson Education India

Relevant Websites (RW)		
Sr No	**(Web address) (only if relevant to the course)**	**Salient Features**
RW-1	https://www.programiz.com/c-programming/c-for-loop	Loops
RW-2	http://www.c4learn.com/c-programs/category/structure-programs	Structures
RW-3	http://www.c4learn.com/c-programs/category/union-programs	Union
RW-4	https://www.cprogramming.com/discussionarticles/sorting_and_searching.html	Linear and binary search
RW-5	https://www.tutorialspoint.com/format-specifiers-in-c	Format specifiers in C language

RW-6	http://tigcc.ticalc.org/doc/keywords.html	Keywords in C
RW-7	http://www.c4learn.com/c-programs/category/1-d-array-programs	Arrays programs
RW-8	http://www.c4learn.com/c-programs/program-bubble-sort-elemets-in-c-all.html	Bubble sort
RW-9	https://www.programiz.com/c-programming/c-dynamic-memory-allocation	Dynamic memory management
RW-10	https://www.exforsys.com/tutorials/c-language/c-structures-and-unions.html	Structures and union
RW-11	https://www.learn-c.org/en/Pointers	Pointers
RW-12	https://users.cs.cf.ac.uk/Dave.Marshall/C/node10.html	Pointers in depth
RW-13	https://www.tutorialspoint.com/cprogramming/c_strings.htm	Strings
RW-14	https://www.tutorialspoint.com/cprogramming/c_arrays.htm	Arrays
RW-15	https://www.tutorialspoint.com/cprogramming/c_storage_classes.htm	Storage classes
RW-16	https://www.tutorialspoint.com/c_standard_library/math_h.htm	Math Library in c
RW-17	https://www.tutorialspoint.com/cprogramming/c_recursion.htm	Recursion
RW-18	https://www.tutorialspoint.com/cprogramming/c_functions.htm	Functions
RW-19	https://www.tutorialspoint.com/cprogramming/c_type_casting.htm	Type Casting
RW-20	https://www.studytonight.com/c/c-input-output-function.php	Input and output statements in C language
RW-21	https://www.learn-c.org/en/While_loops	While loop in iterative constructs
RW-22	https://www.learn-c.org/en/For_loops	For loop in iterative constructs
RW-23	https://www.tutorialspoint.com/cprogramming/c_operators.htm	Operators present in C language
RW-24	https://www.sitepoint.com/fundamentals-of-c/	Basic features of C language
RW-25	https://www.tutorialspoint.com/ansi_c/c_control_statements.htm	Control statements in C language
RW-26	https://www.webcreate.me/best-coding-challenge-websites/	The 10 most popular coding challenge websites for 2022
RW-27	https://www.programiz.com/c-programming	Tutorials and simple explanation of c concepts

Audio Visual Aids (AV)

Sr No	**(AV aids) (only if relevant to the course)**	**Salient Features**
AV-1	https://freevideolectures.com/course/2519/c-programming-and-data-structures	C Video Lectures
AV-2	https://www.youtube.com/playlist?list=PLBlnK6fEyqRggZZgYpPMUxdY1CYkZtARR	Fundamentals of C Programming Video Lectures

Software/Equipments/Databases		
Sr No	**(S/E/D) (only if relevant to the course)**	**Salient Features**
SW-1	https://www.evl.uic.edu/aspale/dvl/dev-cpp/	Using Bloodshed Dev-C++ for OpenGL-GLUT Programming
SW-2	https://www.tutorialspoint.com/online_c_compiler.php	Online compiler for program execution

Virtual Labs (VL)		
Sr No	**(VL) (only if relevant to the course)**	**Salient Features**
VL-1	https://cse02-iiith.vlabs.ac.in/	Virtual Labs
VL-2	https://www.hackerearth.com/	Network of top developers across the world

LTP week distribution: (LTP Weeks)	
Weeks before MTE	7
Weeks After MTE	7
Spill Over (Lecture)	4

Detailed Plan For Lectures

Week Number	Lecture Number	Broad Topic(Sub Topic)	Chapters/Sections of Text/reference books	Other Readings, Relevant Websites, Audio Visual Aids, software and Virtual Labs	Lecture Description	Learning Outcomes	Pedagogical Tool Demonstration/ Case Study / Images / animation / ppt etc. Planned	Live Examples
Week 1	Lecture 1	Basics and introduction to C (The C character set)	T-1	RW-6 RW-23	Components of C character set, discussion on identifiers, keywords and data types	Students will become aware of the basics of C language without which it is not possible to work with C language	Power point presentation and live demonstration on compiler	An example of performing various operations on different kinds of data by a human can be taken to explain the need for various data types

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Week 1	Lecture 1	Basics and introduction to C (Identifiers and keywords)	T-1	RW-6 RW-23	Components of C character set, discussion on identifiers, keywords and data types	Students will become aware of the basics of C language without which it is not possible to work with C language	Power point presentation and live demonstration on compiler	An example of performing various operations on different kinds of data by a human can be taken to explain the need for various data types
		Basics and introduction to C (Data types)	T-1	RW-6 RW-23	Components of C character set, discussion on identifiers, keywords and data types	Students will become aware of the basics of C language without which it is not possible to work with C language	Power point presentation and live demonstration on compiler	An example of performing various operations on different kinds of data by a human can be taken to explain the need for various data types
	Lecture 2	Basics and introduction to C (Constants and variables)	T-1	RW-23 RW-27	Discussion on constant, variable and various arithmetic operators	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
		Basics and introduction to C (Expressions)	T-1	RW-23 RW-27	Discussion on constant, variable and various arithmetic operators	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators

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Week 1	Lecture 2	Basics and introduction to C (Arithmetic operators)	T-1	RW-23 RW-27	Discussion on constant, variable and various arithmetic operators	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
Week 2	Lecture 3	Basics and introduction to C (Constants and variables)	T-1	RW-23 RW-27	Discussion on constant, variable and various arithmetic operators	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
		Basics and introduction to C (Expressions)	T-1	RW-23 RW-27	Discussion on constant, variable and various arithmetic operators	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
		Basics and introduction to C (Arithmetic operators)	T-1	RW-23 RW-27	Discussion on constant, variable and various arithmetic operators	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators

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Week 2	Lecture 4	Basics and introduction to C (Unary)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
		Basics and introduction to C (Relational)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
		Basics and introduction to C (Logical)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
		Basics and introduction to C (Assignment and conditional operators)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators

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Week 2	Lecture 4	Basics and introduction to C (Bitwise operators)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
Week 3	Lecture 5	Basics and introduction to C (Unary)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
		Basics and introduction to C (Relational)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
		Basics and introduction to C (Logical)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators

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Week 3	Lecture 5	Basics and introduction to C (Assignment and conditional operators)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
		Basics and introduction to C (Bitwise operators)	T-1 R-1	RW-23	Discussion on various unary, relational, logical, assignment operators, conditional, bitwise operators along with operator precedence and associativity, example of various expressions involving these operators can be taken	Students will become familiar with performing various operations with the help of C operators	Power point presentation and live demonstration on compiler	An example involving separate operations on various kinds of data in real life can be taken to explain the importance of operators
	Lecture 6	Control structures and Input/Output functions(If, If else, Switch case statements, While, For, Do-while loops)	T-1 R-1	RW-1 RW-21 RW-22 SW-1 SW-2 VL-1	if, if else, switch case statements, while loop for, do while loops,at least 2 examples should be discussed for all the constructs	Students will become aware of which statements to use while dealing with various problems	Power point presentations and live demonstration on compiler	The choices the students face while choosing a career can be used to explain if else and switch case statement, similarly the process of coming to the classroom everyday can be used as an example of iteration

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Week 4	Lecture 7	Control structures and Input/Output functions (Break and continue statements)	T-1 R-1	RW-1 RW-21 RW-22 RW-25	break and continue statements, jump statements namely goto and return, at least 2 examples should be discussed for all the constructs	Students will learn how to use jump execution within the program	Power point presentation and live demonstration on compiler. Animations can also be used for the same	The choices the students face while choosing a career can be used to explain if else and switch case statement, similarly the process of coming to the classroom everyday can be used as an example of iteration
		Control structures and Input/Output functions (Goto,Return)	T-1 R-1	RW-1 RW-21 RW-22 RW-25	break and continue statements, jump statements namely goto and return, at least 2 examples should be discussed for all the constructs	Students will learn how to use jump execution within the program	Power point presentation and live demonstration on compiler. Animations can also be used for the same	The choices the students face while choosing a career can be used to explain if else and switch case statement, similarly the process of coming to the classroom everyday can be used as an example of iteration
	Lecture 8	Control structures and Input/Output functions(Type conversion and type modifiers)	T-1 R-1	RW-19	Importance of type casting and type modifiers should be discussed. Discussion on structured programming	Students will learn how to convert one data into another type of data and use of structured programming	Power point presentation and live demonstration on compiler. Animations can also be used for the same	division operations, cgpa calculation can be given as example of type casting,return can be given as example of result of any operation

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Week 4	Lecture 8	Control structures and Input/Output functions (Designing structured programs in C)	T-1 R-1	RW-19	Importance of type casting and type modifiers should be discussed. Discussion on structured programming	Students will learn how to convert one data into another type of data and use of structured programming	Power point presentation and live demonstration on compiler. Animations can also be used for the same	division operations, cgpa calculation can be given as example of type casting,return can be given as example of result of any operation
Week 5	Lecture 9	Control structures and Input/Output functions (Formatted and unformatted Input/Output functions like printf(), Scanf(), Puts(), Gets () etc)	T-1 R-1	RW-5 RW-20 RW-24 AV-2	printf, scanf functions along with various format specifiers gets, puts, getch, getchar, putchar functions	Students will learn about the suitability of various input and output statements for handling different types of data	Power point presentation and live demonstration on compiler	Different types of information is printed in a newspaper in various ways, separate way is used for printing headlines etc, this example may be used to explain the usage of input and output statements
	Lecture 10				Test 1			
Week 6	Lecture 11	User defined functions and Storage classes(Function prototypes, Function definition)	T-1 R-1	RW-18	Description about user defined functions, methods of calling a function and function prototypes	Students will be able to write customized functions according to the given requirement and will learn modular approach of programming	Power point presentation and live demonstration on compiler	Calling some person on your behalf to do a task can be used as an example of a function
		User defined functions and Storage classes(Function call including passing arguments by value and passing arguments by reference)	T-1 R-1	RW-18	Description about user defined functions, methods of calling a function and function prototypes	Students will be able to write customized functions according to the given requirement and will learn modular approach of programming	Power point presentation and live demonstration on compiler	Calling some person on your behalf to do a task can be used as an example of a function

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Week 6	Lecture 12	User defined functions and Storage classes(Math library functions)	T-1 R-1	RW-16 RW-17	Discussion on various math library functions and recursion.	Students will learn how to use function pow, sqrt, sin, other math function with general purpose task of programming. Discussion on use of recursion.	Power point presentations and live demonstration using compiler	calculating compound interest using pow function, root mean square velocity of any vehicle.how to find roots of quadratic equations using sqrt function and Factorial function.
		User defined functions and Storage classes(Recursive functions)	T-1 R-1	RW-16 RW-17	Discussion on various math library functions and recursion.	Students will learn how to use function pow, sqrt, sin, other math function with general purpose task of programming. Discussion on use of recursion.	Power point presentations and live demonstration using compiler	calculating compound interest using pow function, root mean square velocity of any vehicle.how to find roots of quadratic equations using sqrt function and Factorial function.
Week 7	Lecture 13	User defined functions and Storage classes(Scope rules (local and global scope))	T-1 R-1	RW-15	Lifetime of a variable, Visibility of a variable, Various storage classes such as automatic, external, static and register, example in context to function calls may be used	Students will come to know about the scope and lifetime of variables used in C programs	Power point presentations and live demonstration using compiler	A company operating in a city could be treated as an example of a local variable whereas a company operating all over the world could be treated as an example of external variable

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Week 7	Lecture 13	User defined functions and Storage classes(Storage classes in C namely auto, Extern, Register, Static storage classes)	T-1 R-1	RW-15	Lifetime of a variable, Visibility of a variable, Various storage classes such as automatic, external, static and register, example in context to function calls may be used	Students will come to know about the scope and lifetime of variables used in C programs	Power point presentations and live demonstration using compiler	A company operating in a city could be treated as an example of a local variable whereas a company operating all over the world could be treated as an example of external variable
		SPILL OVER						
Week 7	Lecture 14				Spill Over			
		MID-TERM						
Week 8	Lecture 15	Arrays in C(Declaring and initializing arrays in C)	T-1 R-1	RW-7 RW-14 AV-1 AV-2 VL-2	introduction to arrays, declaration, initialization of arrays	Students will learn about storing data in arrays and performing various operations on it	Power point presentation and live demonstration on compiler	A list of the marks of various students in a class
		Arrays in C(Defining and processing 1D and 2D arrays)	T-1 R-1	RW-7 RW-14 AV-1 AV-2 VL-2	introduction to arrays, declaration, initialization of arrays	Students will learn about storing data in arrays and performing various operations on it	Power point presentation and live demonstration on compiler	A list of the marks of various students in a class
	Lecture 16	Arrays in C(Array applications)	T-1 R-1	RW-7 RW-14 SW-2 AV-1 AV-2 VL-1 VL-2	passing array as a function argument, few sample programs of passing arrays to functions,Insertion and deletion from different positions from array	Students will learn about how to pass an entire array to a function and The students will come to know the basic idea behind looking up an element in a list and how we can insert and delete any data from particular position	Power point presentation and live demonstration on compiler	One of the inbuilt string functions can be used to explain about passing an array to a function,Example of queue can be considered to understand the insertion and deletion

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Week 8	Lecture 16	Arrays in C(Passing arrays to functions)	T-1 R-1	RW-7 RW-14 SW-2 AV-1 AV-2 VL-1 VL-2	passing array as a function argument, few sample programs of passing arrays to functions,Insertion and deletion from different positions from array	Students will learn about how to pass an entire array to a function and The students will come to know the basic idea behind looking up an element in a list and how we can insert and delete any data from particular position	Power point presentation and live demonstration on compiler	One of the inbuilt string functions can be used to explain about passing an array to a function,Example of queue can be considered to understand the insertion and deletion
		Arrays in C(inserting and deleting elements of an array)	T-1 R-1	RW-7 RW-14 SW-2 AV-1 AV-2 VL-1 VL-2	passing array as a function argument, few sample programs of passing arrays to functions,Insertion and deletion from different positions from array	Students will learn about how to pass an entire array to a function and The students will come to know the basic idea behind looking up an element in a list and how we can insert and delete any data from particular position	Power point presentation and live demonstration on compiler	One of the inbuilt string functions can be used to explain about passing an array to a function,Example of queue can be considered to understand the insertion and deletion
Week 9	Lecture 17	Arrays in C(Searching including linear and binary search methods)	T-1 R-1	RW-4 RW-8 RW-14 RW-26 AV-1	Finding a single element in a list using the strategies of linear and binary search is to be discussed. Discussion on arranging array elements into ascending or descending order as well as arranging of strings into ascending or descending order only with bubble sort	The students will come to know the basic idea behind looking up an element in a list. Student will learn basic technique of sorting algorithm as bubble sort	Power point presentation and live demonstration on compiler	

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Week 9	Lecture 17	Arrays in C(Sorting of array using bubble sort)	T-1 R-1	RW-4 RW-8 RW-14 RW-26 AV-1	Finding a single element in a list using the strategies of linear and binary search is to be discussed. Discussion on arranging array elements into ascending or descending order as well as arranging of strings into ascending or descending order only with bubble sort	The students will come to know the basic idea behind looking up an element in a list. Student will learn basic technique of sorting algorithm as bubble sort	Power point presentation and live demonstration on compiler	
	Lecture 18				Test 2			
Week 10	Lecture 19	Pointers in C(Pointer declaration and initialization)	T-1 R-1 R-2	RW-11 RW-12	Need of pointers, declaring and initialization of pointer variables, various operators such as address operators, indirection operator, types of pointers including void, wild and null pointers	Students will learn the knowledge of different types of pointers and their importance, that is generally asked in the placement exams	Power point presentation and live demonstration on compiler	
		Pointers in C(types of pointers –dangling , wild, null, generic (void))	T-1 R-1 R-2	RW-11 RW-12	Need of pointers, declaring and initialization of pointer variables, various operators such as address operators, indirection operator, types of pointers including void, wild and null pointers	Students will learn the knowledge of different types of pointers and their importance, that is generally asked in the placement exams	Power point presentation and live demonstration on compiler	
	Lecture 20	Pointers in C(Pointer operators)	T-1 R-1	RW-11 RW-12	Operations feasible on pointers and arithmetic operations possible on a pointer	Students will learn to work with addresses of the variables	Power point presentation and live demonstration on compiler	
		Pointers in C(Pointer expressions and arithmetic)	T-1 R-1	RW-11 RW-12	Operations feasible on pointers and arithmetic operations possible on a pointer	Students will learn to work with addresses of the variables	Power point presentation and live demonstration on compiler	

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Week 10	Lecture 20	Pointers in C(Operations on pointers)	T-1 R-1	RW-11 RW-12	Operations feasible on pointers and arithmetic operations possible on a pointer	Students will learn to work with addresses of the variables	Power point presentation and live demonstration on compiler	
		Pointers in C(Passing pointer to a function)	T-1 R-1	RW-11 RW-12	Operations feasible on pointers and arithmetic operations possible on a pointer	Students will learn to work with addresses of the variables	Power point presentation and live demonstration on compiler	
Week 11	Lecture 21	Pointers in C(Pointer and one dimensional array)	T-1 R-1	RW-11 RW-12	Operations feasible on pointers vs Arrays	Students will learn the use of array name working like pointer	Power point presentation and live demonstration on compiler	
		Pointers in C(Pointer to a group of one dimensional arrays)	T-1 R-1	RW-11 RW-12	Operations feasible on pointers vs Arrays	Students will learn the use of array name working like pointer	Power point presentation and live demonstration on compiler	
		Pointers in C(Array of pointers)	T-1 R-1	RW-11 RW-12	Operations feasible on pointers vs Arrays	Students will learn the use of array name working like pointer	Power point presentation and live demonstration on compiler	
	Lecture 22				Project			
Week 12	Lecture 23	Dynamic Memory Management(Dynamic Memory Management functions (malloc, calloc, realloc and free))	T-1 R-1	RW-9	Different function used for dynamic memory allocation	Students will learn to work with dynamic memory allocation functions	Power point presentation and live demonstration on compiler	
		Dynamic Memory Management(Memory leak)	T-1 R-1	RW-9	Different function used for dynamic memory allocation	Students will learn to work with dynamic memory allocation functions	Power point presentation and live demonstration on compiler	
	Lecture 24	File I/O(The FILE structure)	T-1 R-1	RW-27 AV-1	Introduction to file and dealing with different modes of files,text and binary files	Students will learn about the importance of file text and binary	Power point presentation and live demonstration on compiler	
		File I/O(Opening and closing files)	T-1 R-1	RW-27 AV-1	Introduction to file and dealing with different modes of files,text and binary files	Students will learn about the importance of file text and binary	Power point presentation and live demonstration on compiler	
		File I/O(Text and binary files)	T-1 R-1	RW-27 AV-1	Introduction to file and dealing with different modes of files,text and binary files	Students will learn about the importance of file text and binary	Power point presentation and live demonstration on compiler	
		File I/O(Reading)	T-1 R-1	RW-27 AV-1	Introduction to file and dealing with different modes of files,text and binary files	Students will learn about the importance of file text and binary	Power point presentation and live demonstration on compiler	

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Week 12	Lecture 24	File I/O(writing and appending files)	T-1 R-1	RW-27 AV-1	Introduction to file and dealing with different modes of files,text and binary files	Students will learn about the importance of file text and binary	Power point presentation and live demonstration on compiler	
		File I/O(Random access of files)	T-1 R-1	RW-27 AV-1	Introduction to file and dealing with different modes of files,text and binary files	Students will learn about the importance of file text and binary	Power point presentation and live demonstration on compiler	
Week 13	Lecture 25	Strings,Derived types including structures and unions(Defining and initializing strings)	T-1 R-1	RW-13	String basics including the use of character arrays to store and manipulate strings, reading and writing from and to strings	Students will learn about strings and the various string input and output functions and will learn how to perform operations on strings	Power point presentation and live demonstration on compiler	
		Strings,Derived types including structures and unions(Reading and writing a string)	T-1 R-1	RW-13	String basics including the use of character arrays to store and manipulate strings, reading and writing from and to strings	Students will learn about strings and the various string input and output functions and will learn how to perform operations on strings	Power point presentation and live demonstration on compiler	
		Strings,Derived types including structures and unions(Processing of string)	T-1 R-1	RW-13	String basics including the use of character arrays to store and manipulate strings, reading and writing from and to strings	Students will learn about strings and the various string input and output functions and will learn how to perform operations on strings	Power point presentation and live demonstration on compiler	
	Lecture 26	Strings,Derived types including structures and unions(Character arithmetic)	T-1 R-1	RW-13	Performing arithmetic operation on characters of string,String processing functions such as strlen, strcpy, strcmp, strcat, character arithmetic including increment, decrement, addition, subtraction operations, string manipulation functions including atof, atoi, atol, itoa,ftoa	Students will come to know about strings and how to perform operations on strings	Power point presentation and live demonstration on compiler	

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Week 13	Lecture 26	Strings,Derived types including structures and unions(String manipulation functions and library functions of string)	T-1 R-1	RW-13	Performing arithmetic operation on characters of string,String processing functions such as strlen, strcpy, strcmp, strcat, character arithmetic including increment, decrement, addition, subtraction operations, string manipulation functions including atof, atoi, atol, itoa,ftoa	Students will come to know about strings and how to perform operations on strings	Power point presentation and live demonstration on compiler	
Week 14	Lecture 27	Strings,Derived types including structures and unions(Declaration of a structure)	T-1 R-1	RW-2 RW-3 RW-10	Introduction to structures including the need of structures,defining and assigning values to a structure, operations which can be carried out on structure members after accessing them, few examples on structures,Creating a pointer to structure,Creating a structure with in a structure	Students will learn about the importance of structures,union and how to work with them	Power point presentation and live demonstration on compiler	
		Strings,Derived types including structures and unions(Definition and initialization of structures)	T-1 R-1	RW-2 RW-3 RW-10	Introduction to structures including the need of structures,defining and assigning values to a structure, operations which can be carried out on structure members after accessing them, few examples on structures,Creating a pointer to structure,Creating a structure with in a structure	Students will learn about the importance of structures,union and how to work with them	Power point presentation and live demonstration on compiler	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 14	Lecture 27	Strings,Derived types including structures and unions(Accessing structures)	T-1 R-1	RW-2 RW-3 RW-10	Introduction to structures including the need of structures,defining and assigning values to a structure, operations which can be carried out on structure members after accessing them, few examples on structures,Creating a pointer to structure,Creating a structure with in a structure	Students will learn about the importance of structures,union and how to work with them	Power point presentation and live demonstration on compiler	
		Strings,Derived types including structures and unions(Structures and pointers)	T-1 R-1	RW-2 RW-3 RW-10	Introduction to structures including the need of structures,defining and assigning values to a structure, operations which can be carried out on structure members after accessing them, few examples on structures,Creating a pointer to structure,Creating a structure with in a structure	Students will learn about the importance of structures,union and how to work with them	Power point presentation and live demonstration on compiler	
		Strings,Derived types including structures and unions(Nested structures)	T-1 R-1	RW-2 RW-3 RW-10	Introduction to structures including the need of structures,defining and assigning values to a structure, operations which can be carried out on structure members after accessing them, few examples on structures,Creating a pointer to structure,Creating a structure with in a structure	Students will learn about the importance of structures,union and how to work with them	Power point presentation and live demonstration on compiler	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 14	Lecture 27	Strings,Derived types including structures and unions(Declaration of a union)	T-1 R-1	RW-2 RW-3 RW-10	Introduction to structures including the need of structures,defining and assigning values to a structure, operations which can be carried out on structure members after accessing them, few examples on structures,Creating a pointer to structure,Creating a structure with in a structure	Students will learn about the importance of structures,union and how to work with them	Power point presentation and live demonstration on compiler	
		SPILL OVER						
Week 14	Lecture 28				Spill Over			
Week 15	Lecture 29				Spill Over			
	Lecture 30				Spill Over			

Scheme for CA:

CA Category of this Course Code is:C010102 (Total 3 tasks, 1 compulsory and out of remaining 1 best out of 2 to be considered)

Component	Iscompulsory	Weightage (%)	Mapped CO(s)
Project	Yes	50	CO1, CO2, CO3, CO4, CO5, CO6
Test 1	NO	50	CO1, CO2
Test 2	NO	50	CO3, CO4

Details of Academic Task(s)

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Academic Task	Objective	Detail of Academic Task	Nature of Academic Task (group/individuals)	Academic Task Mode	Marks	Allottment / submission Week
Project	To evaluate the student’s overall understanding of the C programming concepts	In the project, the students should be provided problems to check for the overall understanding of the C programming concepts. The aim of the project is to check the overall understanding of the students and evaluate them accordingly	Individual	Offline	30	4 / 11
Test 1	To ensure understanding of the concepts and check the student's progress and his performance on individual basis	Test will cover the topics completed in week 1 till week 5	Individual	Offline	30	3 / 5
Test 2	To ensure understanding of the concepts and check the student's progress and his performance on individual basis	Test will cover the topics completed in week 6 till week 8	Individual	Offline	30	7 / 9

Detailed Plan For Practicals

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	List of Practicals / Experiments :	Basics and introduction to C : • Programs to explore different data types and usage. • Programs for different type of operators and the usage.	SW-1 SW-2	The students will become familiar with the C program development environment and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 2	List of Practicals / Experiments :	Basics and introduction to C : • Programs to explore different data types and usage. • Programs for different type of operators and the usage.	SW-1 SW-2	The students will become familiar with the C program development environment and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 3	List of Practicals / Experiments :	Basics and introduction to C : • Programs to explore different data types and usage. • Programs for different type of operators and the usage.	SW-1 SW-2	The students will become familiar with the C program development environment and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform

Practical 4	List of Practicals / Experiments :	Basics and introduction to C : • Programs to explore different data types and usage. • Programs for different type of operators and the usage.	SW-1 SW-2	The students will become familiar with the C program development environment and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 5	List of Practicals / Experiments :	Control structures and Input/Output functions : • Programs on decision making constructs as if, if else and switch. • Programs on formatted and unformatted functions as printf(),scanf(),gets() and puts().	SW-1 SW-2	The students will be familiar with decision making statements and the use in different scenarios and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 6	List of Practicals / Experiments :	Control structures and Input/Output functions : • Programs on decision making constructs as if, if else and switch. • Programs on formatted and unformatted functions as printf(),scanf(),gets() and puts().	SW-1 SW-2	The students will be familiar with decision making statements and the use in different scenarios and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 7	List of Practicals / Experiments :	Control structures and Input/Output functions : • Programs on decision making constructs as if, if else and switch. • Programs on formatted and unformatted functions as printf(),scanf(),gets() and puts().	SW-1 SW-2	The students will be familiar with decision making statements and the use in different scenarios and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 8	List of Practicals / Experiments :	Control structures and Input/Output functions : • Programs on decision making constructs as if, if else and switch. • Programs on formatted and unformatted functions as printf(),scanf(),gets() and puts().	SW-1 SW-2	The students will be familiar with decision making statements and the use in different scenarios and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 9	List of Practicals / Experiments :	Control structures and Input/Output functions : • Programs on decision making constructs as if, if else and switch. • Programs on formatted and unformatted functions as printf(),scanf(),gets() and puts().	SW-1 SW-2	The students will be familiar with decision making statements and the use in different scenarios and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 10	List of Practicals / Experiments :	User defined functions, Storage classes : • Program to explore different prototypes. • Program to differentiate between call by value, call by address. • Program to demonstrate storage classes as auto, register, extern, static.	SW-1 SW-2	The students will be familiar with functions and storage classes and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform

Practical 11	List of Practicals / Experiments :	User defined functions, Storage classes : • Program to explore different prototypes. • Program to differentiate between call by value, call by address. • Program to demonstrate storage classes as auto, register, extern, static.	SW-1 SW-2	The students will be familiar with functions and storage classes and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 12	List of Practicals / Experiments :	User defined functions, Storage classes : • Program to explore different prototypes. • Program to differentiate between call by value, call by address. • Program to demonstrate storage classes as auto, register, extern, static.	SW-1 SW-2	The students will be familiar with functions and storage classes and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 13	List of Practicals / Experiments :	User defined functions, Storage classes : • Program to explore different prototypes. • Program to differentiate between call by value, call by address. • Program to demonstrate storage classes as auto, register, extern, static.	SW-1 SW-2	The students will be familiar with functions and storage classes and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 14	List of Practicals / Experiments :	User defined functions, Storage classes : • Program to explore different prototypes. • Program to differentiate between call by value, call by address. • Program to demonstrate storage classes as auto, register, extern, static.	SW-1 SW-2	The students will be familiar with functions and storage classes and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 15	List of Practicals / Experiments :	Arrays in C and pointers in C : • Program to demonstrate memory arrangement of 1D and 2D array. • Program to demonstrate operations on array as insertion, deletion, searching (linear, binary). • Program to demonstrate bubble sort • Program to demonstrate type of pointers. • Program to demonstrate pointer vs array name.	SW-1 SW-2	The students will be familiar with array and different operations on array and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform

Practical 16	List of Practicals / Experiments :	Arrays in C and pointers in C : • Program to demonstrate memory arrangement of 1D and 2D array. • Program to demonstrate operations on array as insertion, deletion, searching (linear, binary). • Program to demonstrate bubble sort • Program to demonstrate type of pointers. • Program to demonstrate pointer vs array name.	SW-1 SW-2	The students will be familiar with array and different operations on array and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 17	List of Practicals / Experiments :	Arrays in C and pointers in C : • Program to demonstrate memory arrangement of 1D and 2D array. • Program to demonstrate operations on array as insertion, deletion, searching (linear, binary). • Program to demonstrate bubble sort • Program to demonstrate type of pointers. • Program to demonstrate pointer vs array name.	SW-1 SW-2	The students will be familiar with array and different operations on array and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 18	List of Practicals / Experiments :	Arrays in C and pointers in C : • Program to demonstrate memory arrangement of 1D and 2D array. • Program to demonstrate operations on array as insertion, deletion, searching (linear, binary). • Program to demonstrate bubble sort • Program to demonstrate type of pointers. • Program to demonstrate pointer vs array name.	SW-1 SW-2	The students will be familiar with array and different operations on array and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 19	List of Practicals / Experiments :	Arrays in C and pointers in C : • Program to demonstrate memory arrangement of 1D and 2D array. • Program to demonstrate operations on array as insertion, deletion, searching (linear, binary). • Program to demonstrate bubble sort • Program to demonstrate type of pointers. • Program to demonstrate pointer vs array name.	SW-1 SW-2	The students will be familiar with array and different operations on array and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform

Practical 20	List of Practicals / Experiments :	Dynamic memory Management and File I/O: • Program to demonstrate dynamic memory management functions (malloc(),calloc(),realloc() and free(). • Program to create text and binary file with different modes.	SW-1 SW-2	The students will be familiar with dynamic memory allocation and will understand the concept of file and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 21	List of Practicals / Experiments :	Dynamic memory Management and File I/O: • Program to demonstrate dynamic memory management functions (malloc(),calloc(),realloc() and free(). • Program to create text and binary file with different modes.	SW-1 SW-2	The students will be familiar with dynamic memory allocation and will understand the concept of file and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 22	List of Practicals / Experiments :	Dynamic memory Management and File I/O: • Program to demonstrate dynamic memory management functions (malloc(),calloc(),realloc() and free(). • Program to create text and binary file with different modes.	SW-1 SW-2	The students will be familiar with dynamic memory allocation and will understand the concept of file and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 23	List of Practicals / Experiments :	Dynamic memory Management and File I/O: • Program to demonstrate dynamic memory management functions (malloc(),calloc(),realloc() and free(). • Program to create text and binary file with different modes.	SW-1 SW-2	The students will be familiar with dynamic memory allocation and will understand the concept of file and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 24	List of Practicals / Experiments :	Dynamic memory Management and File I/O: • Program to demonstrate dynamic memory management functions (malloc(),calloc(),realloc() and free(). • Program to create text and binary file with different modes.	SW-1 SW-2	The students will be familiar with dynamic memory allocation and will understand the concept of file and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 25	List of Practicals / Experiments :	Strings, User defined types including structures and unions : • Program to demonstrate string operations. • Program to demonstrate structure and nested structures. • Program to differentiate between structure and union.	SW-1 SW-2	The students will be familiar with different operations on strings,structures and union and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform

Practical 26	List of Practicals / Experiments :	Strings, User defined types including structures and unions : • Program to demonstrate string operations. • Program to demonstrate structure and nested structures. • Program to differentiate between structure and union.	SW-1 SW-2	The students will be familiar with different operations on strings,structures and union and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 27	List of Practicals / Experiments :	Strings, User defined types including structures and unions : • Program to demonstrate string operations. • Program to demonstrate structure and nested structures. • Program to differentiate between structure and union.	SW-1 SW-2	The students will be familiar with different operations on strings,structures and union and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
Practical 28	List of Practicals / Experiments :	Strings, User defined types including structures and unions : • Program to demonstrate string operations. • Program to demonstrate structure and nested structures. • Program to differentiate between structure and union.	SW-1 SW-2	The students will be familiar with different operations on strings,structures and union and will get exposure to weekly practice problems on Hackerrank/Hackerearth or equivalent platform
	SPILL OVER			
Practical 29	Spill Over			