

Lovely Professional University, Punjab

Course Code	Course Title	Course Planner	Lectures	Tutorials	Practicals	Credits
CSE101	COMPUTER PROGRAMMING	14335::Dr. Navneet Malik	2	0	2	3
Course Weightage	ATT: 5 CA: 25 MTT: 20 ETT: 50	Exam Category: 13: Mid Term Exam: All MCQ – End Term Exam: MCQ + Subjective				
Course Orientation	KNOWLEDGE ENHANCEMENT, PLACEMENT EXAMINATION(Mass Recruiters)					

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	https://www.edrawsoft.com/explain-algorithm-flowchart.php	Algorithms and Flow chart
RW-3	http://www.c4learn.com/c-programming/c-nested-structure/	Nested structures
RW-4	http://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-programming/c-array-application/	Applications of arrays
RW-8	http://www.c4learn.com/c-programs/program-bubble-sort-elemets-in-c-all.html	Bubble sort
RW-9	http://www.programiz.com/c-programming/c-dynamic-memory-allocation	Dynamic memory management
RW-10	http://www.learn-c.org/en/Structures	Structures
RW-11	http://www.exforsys.com/tutorials/c-language/c-structures-and-unions.html	Structures and unions
RW-12	http://www.learn-c.org/en/Pointers	Pointers
RW-13	http://www.cs.cf.ac.uk/Dave/C/node10.html	Pointers in depth

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.

RW-14	http://www.tutorialspoint.com/cprogramming/c_strings.htm	Strings
RW-15	http://www.tutorialspoint.com/cprogramming/c_arrays.htm	Arrays
RW-16	http://www.tutorialspoint.com/cprogramming/c_storage_classes.htm	Storage classes
RW-17	https://www.tutorialspoint.com/c_standard_library/math_h.htm	Math Library in c
RW-18	http://www.tutorialspoint.com/cprogramming/c_recursion.htm	Recursion
RW-19	http://www.tutorialspoint.com/cprogramming/c_functions.htm	Functions
RW-20	https://www.tutorialspoint.com/cprogramming/c_type_casting.htm	Type Casting
RW-21	https://www.studytonight.com/c/c-input-output-function.php	Input and output statements in C language
RW-22	http://www.learn-c.org/en/While_loops	While loop in iterative constructs
RW-23	http://www.learn-c.org/en/For_loops	For loop in iterative constructs
RW-24	http://www.tutorialspoint.com/cprogramming/c_operators.htm	Operators present in C language
RW-25	http://www.sitepoint.com/fundamentals-of-c/	Basic features of C language
RW-26	http://www.tutorialspoint.com/ansi_c/c_control_statements.htm	Control statements in C language
RW-27	https://www.webcreate.me/best-coding-challenge-websites/	The 10 most popular coding challenge websites for 2019
RW-28	https://www.programiz.com/c-programming	Tutorials and simple explanation of c concepts
RW-29	https://raptor.martincarlisle.com/	RAPTOR for flowchart-based programming environment

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/compile_c_online.php	Online compiler for program execution

Virtual Labs (VL)

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Sr No	(VL) (only if relevant to the course)	Salient Features
VL-1	http://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 (Program development in C)	T-1 R-1	RW-25 AV-1 SW-1 SW-2	Program development in C	Lecture 0's contents should be covered before starting lecture 1, need of programming languages	Power point presentation	
	Lecture 2	Basics and introduction to C (structured programming using algorithm and flow chart)	T-1 R-1 R-2	RW-2 RW-29	Program structure of C program. Various programming tools like flow chart and algorithms.	The students will become familiar with the C program development environment as well as program development tools such as algorithms, flowchart, in addition to this the student will also learn about the basic structure of a C program	RAPTOR for flowchart-based programming environment	

Week 2	Lecture 3	Basics and introduction to C (The C character set)	T-1	RW-5 RW-6	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 3	Basics and introduction to C (Identifiers and keywords)	T-1	RW-5 RW-6	Components of C character set, discussion on identifiers, keywords and data types and a parallel discussion of printf() and scanf()	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-5 RW-6	Components of C character set, discussion on identifiers, keywords and data types and a parallel discussion of printf() and scanf()	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 4	Basics and introduction to C (Constants and variables)	T-1 R-1	RW-28	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 R-1	RW-28	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
	Lecture 4	Basics and introduction to C (Arithmetic operators)	T-1 R-1	RW-24 RW-28	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 3	Lecture 5	Basics and introduction to C (Unary)	T-1 R-1	RW-24	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-24	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-24	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 (Assignment and conditional operators)	T-1 R-1	RW-24	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-24	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-22 RW-23 RW-26 AV-1 VL-1 VL-2	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

Week 4	Lecture 7	Control structures and Input/Output functions (Break and continue statements)	T-1 R-1	RW-22 RW-23 RW-26 RW-28	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 7	Control structures and Input/Output functions (Goto,Return)	T-1 R-1	RW-22 RW-23 RW-26 RW-28	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-20	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.	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.

		Control structures and Input/Output functions (Designing structured programs in C)	T-1 R-1	RW-20	Importance of type casting and type modifiers should be discussed. Discussion on structured programming	Students will learn the use of structured programming	Power point presentation and live demonstration on compiler. Animations can also be used for the same	
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-21	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				Online Assignment 1			
Week 6	Lecture 11	User defined functions and Storage classes(Function prototypes, Function definition)	T-1 R-1	RW-19	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-19	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

	Lecture 12	User defined functions and Storage classes(Math library functions)	T-1 R-1	RW-17 RW-18	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 presentation and discussion along with a live demonstration on 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-17 RW-18	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 presentation and discussion along with a live demonstration on 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)) Storage classes in C namely auto, Extern, Register, Static storage classes)	T-1 R-1	RW-16	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	AV-1 AV-2 VL-2 SW-1 SW-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	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-15 AV-1 AV-2 VL-1	passing array as a function argument, few sample programs of passing arrays to functions	Students will learn about how to pass an entire array to a function	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
		Arrays in C(Passing arrays to functions)	T-1 R-1	RW-7 RW-15 AV-1 AV-2 VL-1	passing array as a function argument, few sample programs of passing arrays to functions	Students will learn about how to pass an entire array to a function	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
		Arrays in C(inserting and deleting elements of an array)	T-1 R-1	RW-4 RW-8	Insertion and deletion from different positions from array.	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	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	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	Finding a word from a dictionary could be taken as an example to explain searching techniques.How to arrange names into alphabetic order, how to arrange cgpa or heights into decending order can be given as live examples.
		Arrays in C(Sorting of array using bubble sort)	T-1 R-1	RW-4 RW-8	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. Students will learn basic technique of sorting algorithm as bubble sort	Power point presentation and live demonstration on compiler	Finding a word from a dictionary could be taken as an example to explain searching techniques.How to arrange names into alphabetic order, how to arrange cgpa or heights into decending order can be given as live examples.
	Lecture 18				Online Assignment 2			
	Lecture 19	Pointers, Dynamic memory allocation (Pointer declaration and initialization)	T-1 R-1	RW-12 RW-13	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	
Week 10								

		Pointers, Dynamic memory allocation (Types of pointers - dangling , wild, null, generic (void))	T-1 R-1	RW-9 RW-12 RW-13 SW-1	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, Dynamic memory allocation (Pointer expressions and arithmetic)	T-1 R-1	RW-12 RW-13	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, Dynamic memory allocation (Pointer operators, Operations on pointers)	T-1 R-1	RW-12 RW-13	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, Dynamic memory allocation (Passing pointer to a function)	T-1 R-1	RW-12 RW-13	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, Dynamic memory allocation (Pointer and one dimensional array)	T-1 R-1	RW-12 RW-13	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, Dynamic memory allocation (Dynamic memory management functions (malloc, calloc, realloc and free))	T-1 R-1	RW-12 RW-13	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 22				Online Assignment 3			
Week 12	Lecture 23	Strings (Defining and initializing strings)	T-1 R-1	RW-14	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 (Reading and writing a string)	T-1 R-1	RW-14	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 (Processing of string)	T-1 R-1	RW-14	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 24	Strings (Character arithmetic)	T-1 R-1	RW-14	Performing arithmetic operation on characters of string.	Students will come to know about strings and how to perform operations on strings	Power point presentation and live demonstration on compiler	
		Pointers, Dynamic memory allocation and Strings(String manipulation functions and library functions of string)	T-1 R-1	RW-14	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 13	Lecture 25	Derived types including structures and unions (Declaration of a structure)	T-1 R-1	RW-10 RW-11	Introduction to structures including the need of structures, declaration 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	Students will learn about the importance of structures and how to work with them	Power point presentation and live demonstration on compiler	
		Derived types including structures and unions (Definition and initialization of structures, (Accessing structures))	T-1 R-1	RW-10 RW-11	Introduction to structures including the need of structures, declaration 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	Students will learn about the importance of structures and how to work with them	Power point presentation and live demonstration on compiler	

	Lecture 26	Derived types including structures and unions (Structures and pointers)	T-1 R-1	RW-3 RW-10	Creating a pointer to structure	Students will learn how to create pointer to structure	Power point presentation and live demonstration on compiler	
		Derived types including structures and unions(Nested structures)	T-1 R-1	RW-3 RW-10	Creating a structure with in a structure	Students will learn how to create structure within the another structure	Power point presentation and live demonstration on compiler	
Week 14	Lecture 27	Derived types including structures and unions (Declaration of a union, Definition and initialization of unions)	T-1 R-1	RW-11	Introduction to unions, difference from structures, accessing union members	Students will come to know about the differences between a structure a union and how to work with a union	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:A0203 (2 best out of 3)

Component	Weightage (%)
Online Assignment	50
Online Assignment	50
Online Assignment	50

Details of Academic Task(s)

Academic Task	Objective	Detail of Academic Task	Nature of Academic Task (group/individuals)	Academic Task Mode	Marks	Allottment / submission Week
Online Assignment 1	To ensure understanding of the concepts and check the student's progress and his performance on individual basis	The assignment will cover the topics completed in week 1 till week 5	Individual	Online	30	3 / 5
Online Assignment 2	To ensure understanding of the concepts and check the student's progress and his performance on individual basis	The assignment will cover the topics completed in week 6 till week 8	Individual	Online	30	7 / 9
Online Assignment 3	To ensure understanding of the concepts and check the student's progress and his performance on individual basis	The assignment will cover the topics completed in week 9 till week 11	Individual	Online	30	10 / 11