Lovely Professional University, Punjab

Course Code	Course Title	Lectures	Tutorials	Practicals	Credits	
CSE202	OBJECT ORIENTED PROGRAMMING	3	0	2	4	
Course Weightage	ATT: 5 CA: 50 ETP: 45	**Exam Category: X6: Mid Term Exam: Not Applicable – End Term Exam: Practical**				
Course Focus	EMPLOYABILITY,SKILL DEVELOPMENT,ENTREPRENEURSHIP					

Course Outcomes :Through this course students should be able to

CO1 :: identify basic programming constructs and use the newly acquired skills to solve extensive programming problems.

CO2 :: discuss the mechanism of code reusability by creating own libraries of functions.

CO3 :: validate the logic building and code formulation by designing code capable of passing various test cases.

CO4 :: interpret the principles of the object-oriented model and apply it in the implementation in C++ language.

CO5 :: develop accurate, reliable and efficient software applications.

CO6 :: apply the knowledge acquired to develop software applications.

	TextBooks (T)		
Sr No	**Title**	**Author**	**Publisher Name**
T-1	OBJECT ORIENTED PROGRAMMING IN C++	ROBERT LAFORE	PEARSON

	Reference Books (R)		
Sr No	**Title**	**Author**	**Publisher Name**
R-1	PROGRAMMING WITH C++	D RAVICHANDRAN	MCGRAW HILL EDUCATION
R-2	OBJECT ORIENTED PROGRAMMING IN C++	E BALAGURUSAMY	MCGRAW HILL EDUCATION

Relevant Websites (RW)		
Sr No	**(Web address) (only if relevant to the course)**	**Salient Features**
RW-1	http://www.studytonight.com/cpp/	Free website where students can learn the basic concepts of programming and also basics and advanced topics of OOPS. Students can also give the practice tests in this interface.
RW-2	https://www.tutorialspoint.com/cplusplus/	Free web site to learn C++ programming for the beginners.
RW-3	https://www.hackerrank.com/	Programming competitions and contests, programming community
RW-4	https://codeforces.com/	Programming competitions and contests, programming community

RW-5	http://www.codechef.com/	CodeChef hosts Online Programming Competition, Programming Contest
RW-6	https://www.hackerearth.com/	HackerEarth is a network of top developers across the world. Developers participate in online coding challenges and hackathons, solve problems.
RW-7	http://www.dailyfreecode.com/Code/perform-array-operations-append-2646.aspx	Array operations
RW-8	http://www.yolinux.com/TUTORIALS/C++MemoryCorruptionAndMemoryLeaks.html	Memory Leak
RW-9	http://www.learncpp.com/	learncpp.com is a totally free website devoted to teaching you to program in C++.
RW-10	http://cplus.about.com/	About C, C++ and C# brings the latest programming tutorials, programming challenges, C++ for beginners

Software/Equipments/Databases		
Sr No	**(S/E/D) (only if relevant to the course)**	**Salient Features**
SW-1	http://www.codeblocks.org/home	To download Code Blocks Compiler for the execution of C++ programs
SW-2	https://www.bloodshed.net/	To download DEV- Cpp for the execution of C++ programs

Virtual Labs (VL)		
Sr No	**(VL) (only if relevant to the course)**	**Salient Features**
VL-1	http://sourceforge.net/projects/vle/	Students need to download the system and study the slightly complex programming environment

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

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	Concepts and Basics of C++ Programming(Differences between procedural and object oriented programming paradigms)	T-1	RW-9 SW-2	Prerequisites of C plus Plus. Delivery of lecture 0 and introduction to the course	Students will come to Know the difference between procedure and object oriented programming	Lecture, Live demonstrations	

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Week 1	Lecture 1	Concepts and Basics of C++ Programming(Features of Input/output Streams)	T-1	RW-9 SW-2	Prerequisites of C plus Plus. Delivery of lecture 0 and introduction to the course	Students will come to Know the difference between procedure and object oriented programming	Lecture, Live demonstrations	
	Lecture 2	Concepts and Basics of C++ Programming(Reading and writing data using cin and cout)	T-1	RW-9	Practice of programs using cin and cout	Students will come to know about cin and cout statements	Lecture, Live demonstrations	
	Lecture 3	Concepts and Basics of C++ Programming(Creating classes, Class objects, Accessing class members)	T-1	RW-9	creating classes, class objects and accessing class members	The students will also know how to create classes and its objects	Lecture, Live demonstrations ,Gamification tools	An example of car can be taken which is a class and a particular model of the car can be an object
Week 2	Lecture 4	Concepts and Basics of C++ Programming(Differences between Structures, Unions, Enumerations and Classes)	T-1 R-2	RW-9 RW-10	Description of structures, unions and classes, Enumeration	Students will learn as how to group multiple data as a single entity and the differences between them	Lecture, Live demonstrations , Gamification tools	A nursery having different variety of flowers can be considered as a class, structure
	Lecture 5	Concepts and Basics of C++ Programming(Inline and Non-inline member functions)	T-1 R-2		To Understand and use concept of inline and non-inline member functions,static data members and static member Functions	Students will learn the use of inline functions,static data members and static member functions	Lecture, Live demonstrations , Gamification tools and Dev C++	
		Concepts and Basics of C++ Programming(Static data members and static member functions)	T-1 R-2		To Understand and use concept of inline and non-inline member functions,static data members and static member Functions	Students will learn the use of inline functions,static data members and static member functions	Lecture, Live demonstrations , Gamification tools and Dev C++	
	Lecture 6	Functions(Functions with Default parameters/arguments)	T-1	RW-1 RW-9	How to use Functions with default parameters,Displaying output in various forms and using inline functions for faster execution	Students will understand as how to use functions with default parameters and understand cascading concepts	Lecture, Live demonstrations , Gamification tools	

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Week 2	Lecture 6	Functions(Inline Functions)	T-1	RW-1 RW-9	How to use Functions with default parameters,Displaying output in various forms and using inline functions for faster execution	Students will understand as how to use functions with default parameters and understand cascading concepts	Lecture, Live demonstrations , Gamification tools	
		Functions(Manipulator Functions)	T-1	RW-1 RW-9	How to use Functions with default parameters,Displaying output in various forms and using inline functions for faster execution	Students will understand as how to use functions with default parameters and understand cascading concepts	Lecture, Live demonstrations , Gamification tools	
Week 3	Lecture 7	Functions(Function overloading and Scope rules)	T-1	RW-9	Details about function overloading, local and global scope variables and friend function , friend function and friend class	Students will understand the advantages of using function overloading, friend function and friend class	Lecture, Live demonstrations, Gamification tools and DevC++	A friend has access to your games and some of your possessions which can be used for friend function
		Functions(Friend of a class (friend function and friend class))	T-1	RW-9	Details about function overloading, local and global scope variables and friend function , friend function and friend class	Students will understand the advantages of using function overloading, friend function and friend class	Lecture, Live demonstrations, Gamification tools and DevC++	A friend has access to your games and some of your possessions which can be used for friend function
	Lecture 8	Functions(Reference variables)	T-1	RW-9	Details about the differences in various function calls and recursion	Students will understand the differences between various function calls, and recursion	Lecture, Live demonstrations, Gamification tools,Dev C++	A record playing from the beginning to end can be used as an example of Recursion as function and member function of class.

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Week 3	Lecture 8	Functions(Differences between Call by value)	T-1	RW-9	Details about the differences in various function calls and recursion	Students will understand the differences between various function calls, and recursion	Lecture, Live demonstrations, Gamification tools,Dev C++	A record playing from the beginning to end can be used as an example of Recursion as function and member function of class.
		Functions(Call by address and call by reference)	T-1	RW-9	Details about the differences in various function calls and recursion	Students will understand the differences between various function calls, and recursion	Lecture, Live demonstrations, Gamification tools,Dev C++	A record playing from the beginning to end can be used as an example of Recursion as function and member function of class.
		Functions(Recursion (Function, Member Function))	T-1	RW-9	Details about the differences in various function calls and recursion	Students will understand the differences between various function calls, and recursion	Lecture, Live demonstrations, Gamification tools,Dev C++	A record playing from the beginning to end can be used as an example of Recursion as function and member function of class.
	Lecture 9	Pointers, Reference Variables, Arrays and String Concepts(Void pointer, Pointer arithmetic, Pointer to pointer)	T-1	RW-2 RW-9	Usage of reference variables and differences from pointers, void pointer and arithmetic operations on pointers, pointer to pointer	The students will learn about the various arithmetic operations on pointers and the types of pointers	Lecture, Live demonstrations, Dev C++	A street sign pointing to the location of a bus terminus could be an example of a pointer
		Pointers, Reference Variables, Arrays and String Concepts(Differences between pointer and reference variables)	T-1	RW-2 RW-9	Usage of reference variables and differences from pointers, void pointer and arithmetic operations on pointers, pointer to pointer	The students will learn about the various arithmetic operations on pointers and the types of pointers	Lecture, Live demonstrations, Dev C++	A street sign pointing to the location of a bus terminus could be an example of a pointer

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Week 4	Lecture 10	Pointers, Reference Variables, Arrays and String Concepts(Possible problems with the use of pointers - Dangling pointer, Wild pointer, Null pointer assignment)	T-1 R-1 R-2	RW-1 RW-8	Various pointers and types of problems which may arise due to the use of pointers classes having pointers as members and this pointer	The students will learn about the various pointers and problems associated with pointer use and use of pointer with object of class	Lecture, Live demonstrations	A street sign pointing to the location of a bus terminus could be an example of pointer
		Pointers, Reference Variables, Arrays and String Concepts(Classes containing pointers, Pointer to objects, this pointer)	T-1 R-1 R-2	RW-1 RW-8	Various pointers and types of problems which may arise due to the use of pointers classes having pointers as members and this pointer	The students will learn about the various pointers and problems associated with pointer use and use of pointer with object of class	Lecture, Live demonstrations	A street sign pointing to the location of a bus terminus could be an example of pointer
	Lecture 11	Pointers, Reference Variables, Arrays and String Concepts(Array declaration and processing of multidimensional arrays (inside main and inside class))	T-1	RW-4 RW-5 RW-6 RW-7 RW-9 SW-1	Declaration and processing of multidimensional arrays and use of array of objects	Students will learn to use multidimensional arrays along with the creation of 1D and multidimensional array of objects	Dev C++, Pair programming	Rows of students all belonging to the same section can be used to explain a multidimensional array
		Pointers, Reference Variables, Arrays and String Concepts(Pointer to data member)	T-1	RW-4 RW-5 RW-6 RW-7 RW-9 SW-1	Declaration and processing of multidimensional arrays and use of array of objects	Students will learn to use multidimensional arrays along with the creation of 1D and multidimensional array of objects	Dev C++, Pair programming	Rows of students all belonging to the same section can be used to explain a multidimensional array
	Lecture 12	Pointers, Reference Variables, Arrays and String Concepts(Array of objects, The Standard C++ string class-defining and assigning string objects)	T-1	RW-9	Using C++ string class, operations on strings	Students will learn to use the string class in C++ effectively	Lecture, Live demonstrations	The address of anyone’s home contains a mix of characters, digits etc and is an example of string

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Week 5	Lecture 13				Test - Code based 1			
	Lecture 14	Pointers, Reference Variables, Arrays and String Concepts(Member functions, Modifiers of string class)	T-1	RW-8	Using C++ string class, operations on strings, substrings of strings, concatenation, operators used with strings, modifiers, member functions	Students will learn to use the string class in C++ effectively	Lecture, Live demonstrations	The address of anyone's home contains a mix of characters, digits etc and is an example of string
	Lecture 15	Constructors, Destructors and File Handling(Manager functions (constructors and destructor), Default constructor)	T-1	RW-9	Manager functions involving various types of constructors, their use and differences	Students will learn about the difference between various types of constructors and their use	Lecture, Live demonstrations	The way of assigning a value to a variable of built in data type can be used to describe constructors
Week 6	Lecture 16	Constructors, Destructors and File Handling (Constructor with default arguments, Destructors)	T-1	RW-9	Manager functions involving various types of constructors, their use and differences.use of destructor	Students will learn about the difference between various types of constructors and the use of constructor and destructor	Lecture, Live demonstrations	The way of assigning a value to a variable of built in data type can be used to describe constructors
		Constructors, Destructors and File Handling (Parameterized constructor, Copy constructor , Initializer lists)	T-1	RW-9	Manager functions involving various types of constructors, their use and differences.use of destructor	Students will learn about the difference between various types of constructors and the use of constructor and destructor	Lecture, Live demonstrations	The way of assigning a value to a variable of built in data type can be used to describe constructors
	Lecture 17	Data File operations (Opening and closing of files, Modes of file)	T-1	RW-10	Use of file handling in C ++, opening and closing files, modes of opening files, reading and writing of files	Students will learn how to open the files, the various modes to open and how to read and write into files	Lecture, Live demonstrations	The file folder which is used to hold the various documents of a person can be used to explain the concept of file handling

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Week 6	Lecture 17	Data File operations(File stream functions, Reading/Writing of files)	T-1	RW-10	Use of file handling in C ++, opening and closing files, modes of opening files, reading and writing of files	Students will learn how to open the files, the various modes to open and how to read and write into files	Lecture, Live demonstrations	The file folder which is used to hold the various documents of a person can be used to explain the concept of file handling
	Lecture 18	Data File operations (Sequential access and random access file processing, Binary file operations)	T-1 R-1 R-2	RW-9	Differences between sequential and random access	Students will learn the difference between sequential and random access and to use file handling in an object oriented program	Lecture, Live demonstrations	The file folder which is used to hold the various documents of a person can be used to explain the concept of file handling
		Data File operations(Classes and file operations, Structures and file operation)	T-1 R-1 R-2	RW-9	Differences between sequential and random access	Students will learn the difference between sequential and random access and to use file handling in an object oriented program	Lecture, Live demonstrations	The file folder which is used to hold the various documents of a person can be used to explain the concept of file handling
Week 7	Lecture 19	Data File operations(Classes and file operations, Structures and file operation)	T-1 R-1 R-2	RW-9	Differences between sequential and random access	Students will learn the difference between sequential and random access and to use file handling in an object oriented program	Lecture, Live demonstrations	The file folder which is used to hold the various documents of a person can be used to explain the concept of file handling
		SPILL OVER						
Week 7	Lecture 20				Spill Over			
	Lecture 21				Spill Over			
		MID-TERM						
Week 8	Lecture 22	Operator Overloading and Type Conversion(Operator Overloading (unary operator, binary operator overloading))	T-1	RW-1 RW-2 RW-9	Usage and program of overloading unary operators in object oriented programming	Students will learn to overload unary operators in an object oriented program	Lecture, Live demonstrations	

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Week 8	Lecture 23	Operator Overloading and Type Conversion(Operator Overloading (unary operator, binary operator overloading))	T-1	RW-1 RW-2 RW-9	Usage and program of overloading unary operators in object oriented programming	Students will learn to overload unary operators in an object oriented program	Lecture, Live demonstrations	
	Lecture 24	Operator Overloading and Type Conversion(Type conversions - basic type to class type, class type to basic type)	T-1 R-1 R-2	RW-9	Conversion of a user defined data type to inbuilt data type and vice versa	Students will learn to convert user defined data type into built in type and inbuilt to user defined type	Lecture, Live demonstrations	
Week 9	Lecture 25	Operator Overloading and Type Conversion(Type conversions - basic type to class type, class type to basic type)	T-1 R-1 R-2	RW-9	Conversion of a user defined data type to inbuilt data type and vice versa	Students will learn to convert user defined data type into built in type and inbuilt to user defined type	Lecture, Live demonstrations	
	Lecture 26	Inheritance(Inheritance Basics – derived class and base class)	T-1 R-1 R-2	RW-2	Inheritance importance and concept of base and derived class and different modes to perform the same.	Students will learn about the importance of inheritance and its modes	Lecture, Live demonstrations, Dev C++, Pair programming	Passing of possessions from parents to children is an example of inheritance
		Inheritance(Modes (private, protected, public inheritance))	T-1 R-1 R-2	RW-2	Inheritance importance and concept of base and derived class and different modes to perform the same.	Students will learn about the importance of inheritance and its modes	Lecture, Live demonstrations, Dev C++, Pair programming	Passing of possessions from parents to children is an example of inheritance
	Lecture 27	Inheritance(Types (simple, multi-level, multiple and hierarchical))	T-1 R-1 R-2	RW-2	various Inheritance types (simple,multi□level, multiple and hierarchical)	Students will learn about the importance of inheritance and its types	Lecture, Live demonstrations, Dev C++, Pair programming	Passing of possessions from parents to children is an example of inheritance
Week 10	Lecture 28	Inheritance(Overriding member functions)	T-1 R-1 R-2	RW-2	How to override member functions	Students will learn about overriding of member functions	Lecture, Live demonstrations, Dev C++, Pair programming	A student sent to attend another class with the same name as that of an existing students in the other class can be used as an example

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Week 10	Lecture 29	Inheritance(Order of execution of constructors and destructors)	T-1	RW-2	The execution order of constructors and destructors,Various ambiguities that may arise in inheritance and the virtual base class. The execution order of constructors and destructors,Various ambiguities that may arise in inheritance and the virtual base class	Students will learn about the order of execution of constructors and destructors,how to resolve various ambiguities in inheritance and the importance of virtual base class	Lecture, Live demonstrations, Pair programming	A grandchild having same birthday presents bought by grandparents and sent to the parents and finally passed on to the child
		Inheritance(Resolving ambiguities in inheritance, Virtual base class)	T-1	RW-2	The execution order of constructors and destructors,Various ambiguities that may arise in inheritance and the virtual base class. The execution order of constructors and destructors,Various ambiguities that may arise in inheritance and the virtual base class	Students will learn about the order of execution of constructors and destructors,how to resolve various ambiguities in inheritance and the importance of virtual base class	Lecture, Live demonstrations, Pair programming	A grandchild having same birthday presents bought by grandparents and sent to the parents and finally passed on to the child
	Lecture 30	Inheritance(Aggregation and Composition.)	T-1 R-1 R-2	RW-2	types of association which are used to represent the relationship between two classes	Students will learn about the both Composition and Aggregation are types of association which are used to represent the relationship between two classes.	Lecture, Live demonstrations, Pair programming	A grandchild having same birthday presents bought by grandparents and sent to the parents and finally passed on to the child
Week 11	Lecture 31				Test - Code based 2			

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Week 11	Lecture 32	Dynamic Memory Management and Polymorphism(Dynamic memory allocation using new and delete operators)	T-1 R-1	RW-9	Allocation and deallocation of memory	Students will learn about allocating and deallocating memory	Lecture, Live demonstrations	
		Dynamic Memory Management and Polymorphism(Memory leak and allocation failures)	T-1 R-1	RW-9	Allocation and deallocation of memory	Students will learn about allocating and deallocating memory	Lecture, Live demonstrations	
	Lecture 33	Dynamic Memory Management and Polymorphism(Virtual destructors, Compile and run time polymorphism, Virtual functions)	T-1	RW-9 SW-1	importance of virtual Destructors,An OOPS concept, difference between early and late binding, importance of virtual Functions	Students will learn the importance of virtual destructors,Students will learn the distinction between compile time and run time polymorphism and use of virtual functions	Lecture, Live demonstrations, Dev C++, Pair programming	
		Dynamic Memory Management and Polymorphism(Pure virtual functions)	T-1	RW-9 SW-1	importance of virtual Destructors,An OOPS concept, difference between early and late binding, importance of virtual Functions	Students will learn the importance of virtual destructors,Students will learn the distinction between compile time and run time polymorphism and use of virtual functions	Lecture, Live demonstrations, Dev C++, Pair programming	
Week 12	Lecture 34	Dynamic Memory Management and Polymorphism(Abstract classes and concrete class)	T-1 R-1 R-2	RW-9 VL-1	Difference between abstract and concrete class,Use of self□referential class	Students will learn The abstract and concrete class,self□referential class	Lecture, Live demonstrations, Dev C++, Pair programming	
		Dynamic Memory Management and Polymorphism(Introduction to Self-Referential class)	T-1 R-1 R-2	RW-9 VL-1	Difference between abstract and concrete class,Use of self□referential class	Students will learn The abstract and concrete class,self□referential class	Lecture, Live demonstrations, Dev C++, Pair programming	

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Week 12	Lecture 35	Dynamic Memory Management and Polymorphism(Dynamic constructors)	T-1 R-1 R-2	RW-1 RW-9	difference between early and late binding,Use of dynamic constructors	Students will learn the difference between early and late binding, the use of dynamic constructors	Lecture, Live demonstrations, Dev C++, Pair programming	
		Dynamic Memory Management and Polymorphism(Early binding and late binding)	T-1 R-1 R-2	RW-1 RW-9	difference between early and late binding,Use of dynamic constructors	Students will learn the difference between early and late binding, the use of dynamic constructors	Lecture, Live demonstrations, Dev C++, Pair programming	
	Lecture 36				Test - Code based 3			
Week 13	Lecture 37	Exception Handling, Templates and Standard Template Library (STL) (Basics of exception handling, Exception handling mechanism)	T-1 R-1 R-2	RW-2 RW-3 RW-9	Usage of the important concept of exception handling and its importance in handling erroneous conditions	Students will learn to deal with error conditions and handle them	Lecture, Live demonstrations	A fire drill to handle fires can be used as an example of exception handling
		Exception Handling, Templates and Standard Template Library (STL) (Throwing mechanism, Catching mechanism)	T-1 R-1 R-2	RW-2 RW-3 RW-9	Usage of the important concept of exception handling and its importance in handling erroneous conditions	Students will learn to deal with error conditions and handle them	Lecture, Live demonstrations	A fire drill to handle fires can be used as an example of exception handling
	Lecture 38				Programming Practice			
	Lecture 39	Exception Handling, Templates and Standard Template Library (STL) (Rethrowing an exception, Function template and class template)	T-1 R-1 R-2	RW-2 RW-9	Use of function and class template	student will learn how to deal with function and class template	Lecture, Live demonstrations	An electronic kit which can be used to build a variety of devices can be used as an example of STL where a variety of functions are available

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Week 14	Lecture 40	Exception Handling, Templates and Standard Template Library (STL) (Class template with inheritance, Introduction to STL- Containers, Algorithms and iterators, Container - Vector and List)	T-1 R-2	RW-1 RW-9	Introduction to STL Containers, Algorithms and Iterators, Container–Vector and List	Students will learn about the concept STL- Containers, Algorithms and iterators, Container - Vector and List)	Lecture, Live demonstrations, Dev C++, pair programming	An electronics kit which can be used to build a variety of devices can be used as an example of STL where a variety of functions are available
		SPILL OVER						
Week 14	Lecture 41				Spill Over			
	Lecture 42				Spill Over			
Week 15	Lecture 43				Spill Over			
	Lecture 44				Spill Over			
	Lecture 45				Spill Over			

Scheme for CA:

CA Category of this Course Code is:C010203 (Total 4 tasks, 1 compulsory and out of remaining 2 best out of 3 to be considered)

Component	Iscompulsory	Weightage (%)	Mapped CO(s)
Test - Code based 1	NO	30	CO1, CO2, CO3
Test - Code based 2	NO	30	CO3, CO4, CO5, CO6
Test - Code based 3	NO	30	CO3, CO4, CO5, CO6
Programming Practice	Yes	40	CO1, CO2, CO3, CO4, CO5, CO6

Details of Academic Task(s)

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Academic Task	Objective	Detail of Academic Task	Nature of Academic Task (group/individuals)	Academic Task Mode	Marks	Allottment / submission Week
Programming Practice	To evaluate student’s overall understanding of the object oriented concepts	The students should be provided problems for the overall understanding of the object oriented concepts. The aim is to check the overall object oriented understanding of the students and evaluate them accordingly.	Individual	Online	20	2 / 13
Test - Code based 1	To ensure understanding of the concepts and check the student's progress and his performance on individual basis	The test will cover the topics completed in week 1,2,3,4	Individual	Online	30	4 / 6
Test - Code based 2	To ensure understanding of the concepts and check the student's progress and his performance on individual basis	The test will cover the topics completed in week 6, week 7 and week 8.	Individual	Online	30	8 / 10
Test - Code based 3	To ensure understanding of the concepts and check the student's progress and his performance on individual basis	The test will cover the topics completed in week 9,10,11,12	Individual	Online	30	12 / 13

Detailed Plan For Practicals

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	List of Practicals / Experiments:	Concepts and Basics of C++ Programming: Programs to define classes and structures, Program to demonstrate inline, non inline member functions and Static function	RW-1 RW-2 SW-1 SW-2	Students will able to understand the concept of class and object

Practical 2	List of Practicals / Experiments:	Concepts and Basics of C++ Programming: Programs to define classes and structures, Program to demonstrate inline, non inline member functions and Static function	RW-1 RW-2 SW-1 SW-2	Students will able to understand the concept of class and object
Practical 3	List of Practicals / Experiments:	Concepts and Basics of C++ Programming: Programs to define classes and structures, Program to demonstrate inline, non inline member functions and Static function	RW-1 RW-2 SW-1 SW-2	Students will able to understand the concept of class and object
Practical 4	List of Practicals / Experiments:	Functions : Program to implement function overloading, friend function and friend class, Program to demonstrate the difference between call by value, call by address and call by reference	RW-1 RW-2 SW-1 SW-2	Students will able to understand the concept of class and object
Practical 5	List of Practicals / Experiments:	Functions : Program to implement function overloading, friend function and friend class, Program to demonstrate the difference between call by value, call by address and call by reference	RW-1 RW-2 SW-1 SW-2	Students will able to understand the concept of class and object
Practical 6	List of Practicals / Experiments:	Pointers, Reference Variables, Arrays and String Concepts: Program to demonstrate the type of pointers, Program to process multidimensional array and array of objects	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of array and array of objects
Practical 7	List of Practicals / Experiments:	Pointers, Reference Variables, Arrays and String Concepts: Program to demonstrate the type of pointers, Program to process multidimensional array and array of objects	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of array and array of objects
Practical 8	List of Practicals / Experiments:	Constructors, Destructors and File Handling: Program to demonstrate constructor, destructor and type of constructors	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of constructor and destructor

Practical 9	List of Practicals / Experiments:	Constructors, Destructors and File Handling: Program to demonstrate constructor, destructor and type of constructors	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of constructor and destructor
Practical 10	List of Practicals / Experiments:	Data File operations: Program to demonstrate the modes of file, Program to demonstrate type of files	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of files in c++
Practical 11	List of Practicals / Experiments:	Data File operations: Program to demonstrate the modes of file, Program to demonstrate type of files	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of files in c++
Practical 12	List of Practicals / Experiments:	Operator Overloading and Type Conversion: Program to demonstrate the operator overloading and type conversion	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of operator overloading and type conversion
Practical 13	List of Practicals / Experiments:	Operator Overloading and Type Conversion: Program to demonstrate the operator overloading and type conversion	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of operator overloading and type conversion
Practical 14	List of Practicals / Experiments:	Operator Overloading and Type Conversion: Program to demonstrate the operator overloading and type conversion	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of operator overloading and type conversion
Practical 15	List of Practicals / Experiments:	Operator Overloading and Type Conversion: Program to demonstrate the operator overloading and type conversion	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of operator overloading and type conversion
Practical 16	List of Practicals / Experiments:	Inheritance: Program to demonstrate the type of inheritance, Program to demonstrate the ambiguities in inheritance	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of inheritance and the types of inheritance

Practical 17	List of Practicals / Experiments:	Inheritance: Program to demonstrate the type of inheritance, Program to demonstrate the ambiguities in inheritance	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of inheritance and the types of inheritance
Practical 18	List of Practicals / Experiments:	Inheritance: Program to demonstrate the type of inheritance, Program to demonstrate the ambiguities in inheritance	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of inheritance and the types of inheritance
Practical 19	List of Practicals / Experiments:	Inheritance: Program to demonstrate the type of inheritance, Program to demonstrate the ambiguities in inheritance	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of inheritance and the types of inheritance
Practical 20	List of Practicals / Experiments:	Dynamic Memory Management and Polymorphism : Program to use new and delete for dynamic memory management, Program to demonstrate the compile time and run time polymorphism, Program to demonstrate abstract class and dynamic constructor	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of Dynamic memory allocation and its advantages over static memory allocation
Practical 21	List of Practicals / Experiments:	Dynamic Memory Management and Polymorphism : Program to use new and delete for dynamic memory management, Program to demonstrate the compile time and run time polymorphism, Program to demonstrate abstract class and dynamic constructor	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of Dynamic memory allocation and its advantages over static memory allocation
Practical 22	List of Practicals / Experiments:	Dynamic Memory Management and Polymorphism : Program to use new and delete for dynamic memory management, Program to demonstrate the compile time and run time polymorphism, Program to demonstrate abstract class and dynamic constructor	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of Dynamic memory allocation and its advantages over static memory allocation

Practical 23	List of Practicals / Experiments:	Dynamic Memory Management and Polymorphism : Program to use new and delete for dynamic memory management, Program to demonstrate the compile time and run time polymorphism, Program to demonstrate abstract class and dynamic constructor	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of Dynamic memory allocation and its advantages over static memory allocation
Practical 24	List of Practicals / Experiments:	Exception Handling, Templates and Standard Template Library (STL) : Program to demonstrate exception handling, Program to demonstrate function template and class template, Program to demonstrate STL-Containers, Algorithms and Iterators.	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of exception handling and templates in c++
Practical 25	List of Practicals / Experiments:	Exception Handling, Templates and Standard Template Library (STL) : Program to demonstrate exception handling, Program to demonstrate function template and class template, Program to demonstrate STL-Containers, Algorithms and Iterators.	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of exception handling and templates in c++
Practical 26	List of Practicals / Experiments:	Exception Handling, Templates and Standard Template Library (STL) : Program to demonstrate exception handling, Program to demonstrate function template and class template, Program to demonstrate STL-Containers, Algorithms and Iterators.	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of exception handling and templates in c++
Practical 27	List of Practicals / Experiments:	Exception Handling, Templates and Standard Template Library (STL) : Program to demonstrate exception handling, Program to demonstrate function template and class template, Program to demonstrate STL-Containers, Algorithms and Iterators.	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of exception handling and templates in c++
Practical 28	List of Practicals / Experiments:	Exception Handling, Templates and Standard Template Library (STL) : Program to demonstrate exception handling, Program to demonstrate function template and class template, Program to demonstrate STL-Containers, Algorithms and Iterators.	RW-1 RW-2 RW-7 SW-1 SW-2	Students will able to understand the concept of exception handling and templates in c++

	SPILL OVER			
Practical 29	Spill Over			