Lovely Professional University, Punjab

Course Code	Course Title	Lectures	Tutorials	Practicals	Credits	
CSE233	OBJECT ORIENTED PROGRAMMING	0	0	4	2	
Course Weightage	ATT: 5 CA: 30 MTT: 20 ETT: 45					
Course Focus	EMPLOYABILITY,SKILL DEVELOPMENT					

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	https://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://www.hackerearth.com/	HackerEarth is a network of top developers across the world. Developers participate in online coding challenges and hackathons, solve problems

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-5	https://www.learncpp.com/	learncpp.com is a totally free website devoted to teaching you to program in C++
RW-6	https://www.thoughtco.com/c-and-c-plus-programming-4133470	About C, C++ and C# brings the latest programming tutorials, programming challenges, C++ for beginners
RW-7	https://www.codechef.com/	CodeChef hosts Online Programming Competition, Programming Contest

Software/Equipments/Databases

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

Scheme for CA:

CA Category of this Course Code is:A0203 (2 best out of 3)

Component	Weightage (%)	Mapped CO(s)
Test - Code based	50	CO4, CO5, CO6
Test 1	50	CO1, CO2, CO3
Test 2	50	CO2, CO3, CO4

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
Test 1	To evaluate each student on the basis of his/her performance	The test will cover the topics completed in week 1 to 4	Individual	Online	30	5 / 6
Test 2	To evaluate each student on the basis of his/her performance	The test will cover the topics completed in week 5 to 8	Individual	Online	30	7 / 9

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.

Test - Code based	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 to week 11	Individual	Offline	30	10 / 11

Detailed Plan For Practicals

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	Concepts and Basics of C++ Programming :	Differences between procedural and object oriented programming paradigms	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Lecture Zero to be discussed and Student will explore the classes, objects and member functions
	Concepts and Basics of C++ Programming :	Features of Input/output Streams	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes,objects and member functions
	Concepts and Basics of C++ Programming :	Reading and writing data using cin and cout	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes,objects and member functions

Practical 1	Concepts and Basics of C++ Programming :	Creating classes	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes,objects and member functions
	Concepts and Basics of C++ Programming :	Class objects	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes,objects and member functions
	Concepts and Basics of C++ Programming :	Accessing class members	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes,objects and member functions
	Concepts and Basics of C++ Programming :	Differences between Structures, Unions and Classes	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes,objects and member functions

Practical 1	Concepts and Basics of C++ Programming :	Enumeration	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes,objects and member functions
	Concepts and Basics of C++ Programming :	Inline and Non inline member functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes,objects and member functions
	Concepts and Basics of C++ Programming :	Static data members and static member functions.	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes,objects and member functions
Practical 2	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 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore the classes, objects and member functions

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.

Practical 3	Functions:	Functions with Default parameters/arguments	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore types of function calls and non member functions
	Functions:	Inline Functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore types of function calls and non member functions
	Functions:	Manipulator Functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore types of function calls and non member functions
	Functions:	Function overloading and Scope rules	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore types of function calls and non member functions

Practical 3	Functions:	Friend of a class (friend function and friend class)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore types of function calls and non member functions
	Functions:	Reference variables	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore types of function calls and non member functions
	Functions:	Differences between Call by value, Call by address and call by reference	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore types of function calls and non member functions
	Functions:	Recursion(Function, Member Function).	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore types of function calls and non member functions

Practical 4	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 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore types of function calls and non member functions
Practical 5	Pointers, Reference Variables, Arrays and String Concepts:	Differences between pointer and reference variables	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Void pointer	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Pointer arithmetic	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays

Practical 5	Pointers, Reference Variables, Arrays and String Concepts:	Pointer to pointer	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Possible problems with the use of pointers - Dangling pointer, Wild pointer, Null pointer assignment	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Classes containing pointers	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Pointer to objects	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays

Practical 5	Pointers, Reference Variables, Arrays and String Concepts:	this pointer	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Pointer to data member	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Array declaration and processing of multidimensional arrays(inside main and inside class)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Array of objects	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays

Practical 5	Pointers, Reference Variables, Arrays and String Concepts:	The Standard C++ string class- defining and assigning string objects	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Member functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Modifiers of string class.	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
Practical 6	Pointers, Reference Variables, Arrays and String Concepts:	Modifiers of string class.	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays

Practical 6	Pointers, Reference Variables, Arrays and String Concepts:	Member functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	The Standard C++ string class-defining and assigning string objects	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Array of objects	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Array declaration and processing of multidimensional arrays(inside main and inside class)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays

Practical 6	Pointers, Reference Variables, Arrays and String Concepts:	Pointer to data member	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	this pointer	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Pointer to objects	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Classes containing pointers	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays

Practical 6	Pointers, Reference Variables, Arrays and String Concepts:	Possible problems with the use of pointers - Dangling pointer, Wild pointer, Null pointer assignment	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Pointer to pointer	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Pointer arithmetic	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
	Pointers, Reference Variables, Arrays and String Concepts:	Void pointer	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays

Practical 6	Pointers, Reference Variables, Arrays and String Concepts:	Differences between pointer and reference variables		RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
Practical 7	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-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore pointers, strings and arrays
Practical 8	Test 1				
Practical 9	Constructors, Destructors and File Handling:	Manager Functions (constructors and destructor)		RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
	Constructors, Destructors and File Handling:	Default constructor		RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors

Practical 9	Constructors, Destructors and File Handling:	Parameterized constructor	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
	Constructors, Destructors and File Handling:	Copy constructor	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
	Constructors, Destructors and File Handling:	Initializer lists	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
	Constructors, Destructors and File Handling:	Destructors	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors

Practical 9	Constructors, Destructors and File Handling:	Constructor with default arguments	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
Practical 10	Constructors, Destructors and File Handling:	Constructor with default arguments	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
	Constructors, Destructors and File Handling:	Destructors	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
	Constructors, Destructors and File Handling:	Initializer lists	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors

Practical 10	Constructors, Destructors and File Handling:	Copy constructor	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
	Constructors, Destructors and File Handling:	Parameterized constructor	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
	Constructors, Destructors and File Handling:	Default constructor	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
	Constructors, Destructors and File Handling:	Manager Functions (constructors and destructor)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors

Practical 11	Constructors, Destructors and File Handling	Program to demonstrate constructor, destructor and type of constructors	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore different type of constructors
Practical 12	Data File operations:	Opening and closing of files	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	Modes of file	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	File stream functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file

Practical 12	Data File operations:	Reading/Writing of files	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	Sequential access and random access file processing	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	Binary file operations	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	Structures and file operations	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file

Practical 12	Data File operations:	Classes and file operations	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
Practical 13	Data File operations:	Classes and file operations	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	Structures and file operations	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	Binary file operations	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file

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.

Practical 13	Data File operations:	Sequential access and random access file processing	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	Reading/Writing of files	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	File stream functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
	Data File operations:	Modes of file	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file

Practical 13	Data File operations:	Opening and closing of files	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
Practical 14	Data File operations	Program to demonstrate the modes of file. Program to demonstrate type of files.	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will explore use of file and different modes of file
Practical 15	Operator Overloading and Type Conversion:	Operator Overloading (unary operator, binary operator overloading)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn about operator overloading and type conversion
	Operator Overloading and Type Conversion:	Type conversions - basic type to class type	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn about operator overloading and type conversion

Practical 15	Operator Overloading and Type Conversion:	class type to basic type	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn about operator overloading and type conversion
Practical 16	Operator Overloading and Type Conversion:	class type to basic type	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn about operator overloading and type conversion
	Operator Overloading and Type Conversion:	Type conversions - basic type to class type	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn about operator overloading and type conversion
	Operator Overloading and Type Conversion:	Operator Overloading (unary operator, binary operator overloading)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn about operator overloading and type conversion

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.

Practical 17	Operator Overloading and Type Conversion	Program to demonstrate the operator overloading and type conversion.	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn about operator overloading and type conversion
Practical 18	Inheritance:	Inheritance Basics – derived class and base class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Types (simple, multi-level, multiple and hierarchical)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Modes (private, protected, public inheritance)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance

Practical 18	Inheritance:	Overriding member functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Order of execution of constructors and destructors	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Virtual base class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Resolving ambiguities in inheritance	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance

Practical 19	Inheritance:	Resolving ambiguities in inheritance	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Virtual base class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Order of execution of constructors and destructors	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Overriding member functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance

Practical 19	Inheritance:	Modes (private, protected, public inheritance)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Types (simple, multi-level, multiple and hierarchical)	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
	Inheritance:	Inheritance Basics – derived class and base class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
Practical 20	Inheritance	Program to demonstrate the type of inheritance. Program to demonstrate the ambiguities in inheritance	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Student will learn the need of inheritance and types of inheritance
Practical 21	Test 2			

Practical 22	Dynamic Memory Management and Polymorphism :	Dynamic memory allocation using new and delete operators	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Memory leak and allocation failures	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Virtual destructors	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Compile and run time polymorphism	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class

Practical 22	Dynamic Memory Management and Polymorphism :	Virtual functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Pure virtual functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Dynamic constructors.	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Abstract classes and concrete class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class

Practical 22	Dynamic Memory Management and Polymorphism :	Introduction to Self-Referential class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Early binding and late binding	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
Practical 23	Dynamic Memory Management and Polymorphism :	Early binding and late binding	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Introduction to Self-Referential class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class

Practical 23	Dynamic Memory Management and Polymorphism :	Abstract classes and concrete class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Dynamic constructors.	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Pure virtual functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Virtual functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class

Practical 23	Dynamic Memory Management and Polymorphism :	Compile and run time polymorphism	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Virtual destructors	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Memory leak and allocation failures	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Dynamic memory allocation using new and delete operators	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class

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.

Practical 24	Dynamic Memory Management and Polymorphism :	Dynamic memory allocation using new and delete operators	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Memory leak and allocation failures	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Virtual destructors	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Compile and run time polymorphism	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class

Practical 24	Dynamic Memory Management and Polymorphism :	Virtual functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Pure virtual functions	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Dynamic constructors.	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Abstract classes and concrete class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class

Practical 24	Dynamic Memory Management and Polymorphism :	Introduction to Self-Referential class	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
	Dynamic Memory Management and Polymorphism :	Early binding and late binding	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
Practical 25	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-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about dynamic memory allocation, concrete and abstract class
Practical 26	Test - Code based			
Practical 27	Exception Handling, Templates and Standard Template Library (STL) :	Basics of exception handling	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about exception handling and need of STL

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.

Practical 27	Exception Handling, Templates and Standard Template Library (STL) :	Exception handling mechanism	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about exception handling and need of STL
	Exception Handling, Templates and Standard Template Library (STL) :	Throwing mechanism	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about exception handling and need of STL
	Exception Handling, Templates and Standard Template Library (STL) :	Catching mechanism	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about exception handling and need of STL
	Exception Handling, Templates and Standard Template Library (STL) :	Rethrowing an exception	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about exception handling and need of STL

Practical 27	Exception Handling, Templates and Standard Template Library (STL) :	Function template and class template	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about exception handling and need of STL
	Exception Handling, Templates and Standard Template Library (STL) :	Introduction to STL- Containers, Algorithms and iterators	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about exception handling and need of STL
	Exception Handling, Templates and Standard Template Library (STL) :	Container - Vector and List	RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about exception handling and need of STL
Practical 28	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-3 RW-4 RW-5 RW-6 RW-7 SW-1 SW-2	Students will know about exception handling and need of STL
	SPILL OVER			
Practical 29	Spill Over			