**UNIT 1**

**Lecture 1:** Basic Introduction to Procedural & OOP

**UNIT 2**

**Lecture 2:**

* Read & Write using cin and cout
* Datatypes
* Operators
* Conditional and Loops

**Lecture 3:** Classes and Objects

**Lecture 4:**

* Structure and Union
* Enumeration

**Lecture 5:**

* Inline and Non-Inline Function
* Static data member and Member function

**Lecture 6**

* Function with default argument
* Manipulator Function

**Lecture 7**

* Function Overloading
* Scope Rules
* Friend function & class

**Lecture 8**

* Functions and Types: Call by value & Call by reference
* Recursion & Member Function using recursion

**Lecture 9**

* Pointer in CPP (Pointer Arithmetic)
* Void pointer
* Pointer Arithmetic
* Pointer to pointer

**Lecture 10**

* Types of Pointers
* Pointer to objects
* this pointer
* Class containing pointers

**Lecture 11**

* 1D Arrays
* 2D & Multidimensional Arrays

**Lecture 12:** Array of objects

**Lecture 13:** Member functions

**Lecture 14**

* Modifiers of string class
* Strings

**UNIT 3**

**Lecture 15**

* Constructor and Destructor
* Default Constructor and Destructor

**Lecture 16**

* Parametrized constructor\_Copy Constructor\_Initializer list
* Constructor with default arguments

Lecture 17(missed)

**Lecture 18: File Handling**

* Lecture 19
* Sequential & Random Access
* File Operations

Lecture 20 (missed)

Lecture 21(missed)

**UNIT 4**

**Lecture 22**

* Unary Operator Overloading
* Operator Overloading

**Lecture 23:** Binary Operator Overloading

**Lecture 24**

* Type conversion
* Basic to class type conversion

**Lecture 25:** Class to basic type conversion

Lecture 26 (missed)

**Lecture 27:** Inheritance - Basics

**Lecture 28:** Types of Inheritance

**Lecture 29:** Resolving ambiguity in Inheritance

**Lecture 30:** Order of execution of Constructors & Destructors

**UNIT 5**

**Lecture 31:** DMA - Using new and delete

Lecture 32 (missed)

**Lecture 33**: DMA - Memory Leak

**Lecture 34**

* Virtual Destructor
* Polymorphism
* Virtual Function
* Pure Virtual Function

**Lecture 35**

* Abstract class and Concrete class
* Self referential class

**Lecture 36**

* Early binding and Late binding
* Dynamic constructor

**UNIT 6**

**Lecture 37**

* try, catch, throw mechanisms
* Exception Handling

**Lecture 38:** throw, catch mechanism

**Lecture 39**

* Rethrowing exception
* Templates in C++
* Standard Template Library
* Types of templates

**Lecture 40**

* Class template with Inheritance
* Introduction to STL
* STL – Algorithms (Searching Algorithm & Sorting Algorithm )
* STL – Iterators
* STL – Vectors
* STL – Lists
* Containers

**Unit I**

Principles of OOP and C++ essentials : procedural vs object oriented programming paradigms, Input/output streams, classes and objects, structure vs union, enumerations and classes, static data members and functions, user defined functions, inline function, friend function and friend class, reference variables, differentiate among call by value, call by address and call by reference, recursion

**Unit II:** Handling pointers, arrays and string : pointer vs reference variables, void pointer, pointer arithmetic, pointer to pointer, dangling pointer, wild pointer, null pointer assignment, pointers as class member, pointer to objects, this pointer, pointer to data member, array declaration and processing of multidimensional arrays (inside main and inside class), array of objects, standard C++ string class defining and assigning string objects, modifiers of string class

**Unit III:** Constructors, destructors and managing file operations : features of constructor function, default constructor, constructor vs normal function, parameterized constructor, copy constructor, initializer lists, constructor with default arguments, destructor, opening and closing of files, modes of file, file stream functions, reading/writing of files, sequential access and random access for file processing, binary file operations, classes and file operations, structures and file operation

**Unit IV:** Operator overloading, type casting and re-usability : importance of operator overloading, unary operator overloading, binary operator overloading, type conversions - basic type to class type and class type to basic type, importance of re-usability (inheritance), basics of inheritance – base class and derived class, types of inheritance (simple, multi-level, multiple, hierarchical and hybrid), modes of inheritance (private, protected, public), overriding of member functions, order of execution of constructors and destructor, resolving ambiguities in inheritance, virtual base class

**Unit V:** Dynamic memory management and polymorphism : importance of dynamic memory allocation, dynamic memory allocation using new and delete operators, memory leak and allocation failures, virtual destructor, compile time polymorphism vs run time polymorphism, virtual functions, pure virtual functions, abstract classes and concrete class, self-referential classes, early binding and late binding, dynamic constructors

**Unit VI:** Handling exceptions, templates and STL : basics of exception handling, exception handling mechanism, throwing exception mechanism, catching exception mechanism, re-throwing an exception, function template and class template, class template and inheritance, introduction and importance of Standard Template Library (STL) - containers, algorithms and iterators, container - vector and list