

- **Introduction to C++**

- Basic concepts of OOP, benefits, applications of OOP
- A simple C++ program
- Structure of C++ program
- Creating a source file, compiling and Linking

- **Tokens, Expressions and Control structures**

- Introduction
- Tokens, keywords, Identifiers and constants
- Data types - Basic, User defined and Derived
- Symbolic constant
- Type Compatibility
- Variables - Declaration and Dynamic initialization
- Reference variable
- Operators in C++
- Scope resolution operator
- Member Referencing operators
- Memory management operators
- Manipulators
- Type cast operators
- Expression and their types
- Special Assignment Expressions
- Implicit conversions
- Operator overloading introduction
- Operator precedence
- Control structures – if-else, do-while, for , switch

- **Functions in C++**

- Introduction
- The main function
- Function prototyping
- Call by reference
- Return by reference
- Inline function – Making an outside function Inline
- Arguments - default, constant
- Math library functions

- **Classes and Objects**

- Introduction

- Creating a class and objects
- Defining member functions inside and outside class
- Definition
- Nesting of member functions
- Private member functions
- Arrays within a class
- Memory allocation of objects
- Static data members and static member functions
- Array of objects
- Objects as function arguments
- Friend functions
- Returning objects
- Constructors
- Types of constructor
- Destructors

- **Inheritance**

- Introduction
- Base class and derived class examples
- Types of Inheritance
- Virtual base class
- Abstract class
- Constructors in derived class

- **Polymorphism**

- Compile Time Polymorphism
- Function overloading
- Operator Overloading Introduction
- Overloading unary and binary operator
- Overloading using friend function
- Overloading insertion and extraction operators
- String manipulation using operator overloading
- Runtime Polymorphism
- this Pointer, pointers to objects, pointer to derived classes, Virtual functions and pure virtual functions

- **Managing console I/O operations**

- Introduction
- C++ streams and C++ stream classes
- Unformatted I/O operations
- Formatted console I/O operations
- Managing output with manipulators

- **Working with Files**

- Classes for File Stream operations
- File operations - Opening, Closing and updating
- Error handling during File operations
- Command Line arguments

- **Templates**

- Introduction
- Class Templates
- Function Templates
- Exception Handling(Introduction)