

## Programming in C++

Duration: 36 Hrs.

### Introduction to oops

- Class
- Object
- Encapsulation
- Abstraction
- Data Hiding
- Polymorphism
- Inheritance
- Message Passing

### Pointer array Reference

- Pointer variable
- Reference variable/alias variables
- Reference to Reference variable
- Dynamic memory allocation
- The new and delete operator

### Function

- Definition of functions and uses
- Function Prototype
- Parameter Passing Techniques
- Call by Value
- Call by Reference
- Call by Pointer
- Inline Functions
- Default Arguments
- Function Overloading
- Lambda function
- Recursion

### Classes and Objects

- Declaring / defining classes
- Data members and member functions
- Scope Resolution Operator
- Access specifiers : public and private and protected
- Creating objects of a class
- Array of Objects
- Pointers to object

- Implicit this pointer
- Static data members
- Static member functions
- Passing objects to a member function
- Returning objects from a member function
- Friend functions
- Friend classes
- Nested classes
- Inline Function

### **Constructors and Destructors**

- Defining Constructor
- Defining Destructor
- Comparing Constructor and Member Function
- Default Constructor and Argument Constructor
- Copy Constructor
- Constructor Overloading
- Private Constructor and Destructor
- Difference between member Function Overloading and Overriding
- Constructor and virtual function

### **Operator Overloading**

- Need of Overloading
- Defining Operator Overloaded Function
- Operator Overloading Rules
- Overloading Binary Operators
- Overloading Binary Operators using Friend
- Overloading Other Operators
- Overloading Unary Operators
- Overloading Unary Operators using Friend

### **Inheritance and Composition**

- Introduction to Inheritance
- Types of Inheritance
- Single Level Inheritance
- Multilevel Inheritance
- Multiple Inheritance
- Name ambiguities under multiple inheritance
- Hierarchical Inheritance
- Hybrid Inheritance

- Multipath Inheritance
- Virtual base classes
- Constructor and Destructor in Inheritance

### Polymorphism

- About polymorphism
- Compile time and runtime polymorphism
- Virtual functions
- Pure virtual function and abstract base class

### Exception handling

- Introduction to an exception
- Throwing an exception
- Catching an exception
- Trying for an exception
- Order of catch blocks
- Catching all exceptions
- User defined Exception

### Input / Output in C++: Streams

- Hierarchy of I/O Streams
- Fundamental stream classes and objects
- Standard input and output functions
- Formatting flags and manipulators

### File Handling

- File Stream classes
- Opening and closing a file- File opening modes
- File pointers and their manipulations
- Error handling in file
- Text File Handling
- Binary File Handling
- File Management Operations

### Namespace

- Creating namespace
- Using namespace
- Nested namespace and anonymous namespace

### Templates

- Need of Template
- What are function templates
- Argument deduction and template parameters
- Overloading function templates
- What are class templates
- Specializations of class templates

### Thread

Concepts and sample code segment for thread creation.

### Project

