STC/PRGL/CT02: **Certificate Course in Programming in C++**

Objective of the Course

The objective of the course is to make candidates aware of the Object Oriented Programming using C++. The candidates are expected to learn the various features of OOPs and Programming Techniques in C++ and use these programming concepts in software development.

Course Contents

1. Introduction.   02 hours
2. C++ Programming basics.   14 hours
3. Functions   10 hours
4. Object and Classes   10 hours
5. Arrays & Strings , Pointers and References   12 hours
6. Function overloading   06 hours
7. Inheritance   06 hours
8. Virtual Functions   04 hours
9. Streams and Files   10 hours
10. Templates and Exceptions   06 hours

Detailed Syllabus

1. **Introduction :** Overview of OOPs concepts .
2. **C++ Programming basics:** Variables, Expressions, Data types, Storage classes, Constants, Operators, Statements, Loops.
3. **Functions :**   Function Prototype , Function Definition , Function Calling , Scope Rules of Functions , Overview of Operator Functions , Inline Functions , Friend Functions Virtual Functions etc **.**
4. **Object and Classes :** Defining Classes , Structures and Classes , Understanding of classes and structures and union , Friend Functions , Friend classes , inline functions , Constructors and Destructors , Parameterized Constructors , Order of executions of constructors and destructors , Static class members i.e Static data member and static member functions , Scope resolution operator , Nested Classes , Local Classes , Passing Object to Functions , Returning Object by Functions , Object Assignment etc.
5. **Arrays & Strings , Pointers and References :** Arrays of object, Pointers to Object , this pointer , pointers to derived type , pointer to class member , Reference parameter , Passing references , Returning references , References to derived type , C++ dynamic allocation operators , Strings.
6. **Function Overloading:**   Function Overloading, Overloading Constructors, Function Overloading and ambiguity, Overloading Binary and Unary Operators using Member Operator functions,   Overloading Binary and Unary Operators using friend functions, Operator Overloading Restrictions, Overloading new and delete.

7. **Inheritance :** Concept of inheritance, Derived class and based class , Base class access control Inheritance and protected members , Multiple Inheritance, Multilevel Inheritance , Constructors & Destructors in Inheritance ,Order of execution of constructors and Destructors Passing Parameter to base class constructors Virtual Base classes.

8. **Virtual Functions:** Virtual Functions, calling virtual function through a base,   pure virtual functions, abstract classes, using virtual functions, Early and Late binding.

9. **Streams and Files :** C++ streams, C++ stream classes, C++ predefined streams, Formatted I/O, overloading the extraction and insertion operators, File classes, opening and closing file, reading & writing text files, unformatted and binary I/O, detecting EOF, Random access etc.

10. **Templates and Exceptions:** Function templates, Class templates, Exceptions handling.