PROTEC Computer Consultancy

Course Outline

Object oriented programming through C++

Introduction:

Object oriented programming (OOP) has become the preferred programming approach by the software industries. C++ is an object oriented programming language. C++ is an extension of C language with a major addition of class construct features with OOPs.

It is a versatile language for handling very large programs and used in different applications like developing editors, compilers, databases etc. This program is mainly focused on the OOPs concepts with C++ language.

Detailed Course Contents:

1. Principles of Object Oriented Programming (1 ½ hrs)

Object- Oriented Programming Paradigm, Basic Concepts of Object Oriented Programming, Benefits of OOP, Object Oriented Languages, Applications of OOP.

2. Beginning with C++ (1 ½ hrs)

What is C++? Applications of C++, Library of C++, Structure of C++ Program, Compiling and Linking.

3. Tokens, Expressions and Control statements (6 hrs)

Introduction, Tokens, Keywords, Identifiers, Basic data types, User-Defined data types, Storage Classes, Derived data types, Constants,

Type Compatibility, Declaration of Variable, Initialization of Variable, Reference Variable, Operators in C++, Manipulators, Typecasting, Expressions, Implicit Conversions, Operator Precedence, Control Statements.

4. Derived Data type: Array (4 ½ hrs)

Introduction to Array, Declaration and Initialization of an Array, Processing of Array, Types of Array, Strings.

5. Functions in C++ (4 ½ hrs)

Introduction, The Main Function, Function Prototyping, Call by Value, Call by Reference, Return by Reference, Inline Functions, Default Arguments, const Arguments, Recursion, Friend Functions, Library Functions.

6. Classes and Objects (6 hrs)

Introduction to a Class and Objects, Defining Members Functions, A C++ program with Class, Private Member Functions, Access Modifiers, Memory allocation for Objects, Static data members, Static Member Functions, Array within Class, Array of Objects, Objects as Function Arguments, Returning Objects, Pointers to Members, Local Classes.

7. Constructors and Destructors (3 hrs)

Introduction, Constructors, Parameterized Constructors, Multiple Constructors, Constructors with Default Arguments, Copy Constructors, Dynamic Constructors, and Destructors.

8. Operator Overloading and Type Conversions (3 hrs)

Defining Operator Overloading, Types of Operator Overloading (Unary and Binary), Manipulation of Strings using Operators, Rules of Overloading, and Type Conversions.

9. Inheritance: Extending Classes (6 hrs)

Inheritance: Introduction, Defining Derived Classes, Types of Inheritance: Single Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Multiple Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes: Nesting Classes.

10. Pointers, Virtual Functions and Polymorphism (9 hrs)

Introduction: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions

11. Managing Console I/O Operations (3 hrs)

Introduction to C++ Streams Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators.

12. File Handling (6 hrs)

Classes for File Stream Operations, Opening and Closing of Files, Detecting End-Of-File, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Appending a File, Random Access to a file, Error Handling, Command Line Arguments.

13. Templates (3 hrs)

Introduction to Class Templates, Class Templates with Multiple Parameters, Function Templates with Multiple Parameters, Overloading of Template Functions, Member Function Templates

14. Exception Handling (3 hrs)

Basics of Exception Handling, Exception Handling Mechanism, Throwing Mechanism, Catching Mechanism, Rethrowing an Exception, Exceptions in Constructors and Destructors.