

C++ Programming Course Content:35-40hours

Course Outline

- **Chapter 1: Perspective**

- The Software Crisis
- Design Techniques
- Large Software Systems
- Roots of Object Technology
- What Is Object-Oriented Programming?
- C++ and Object-Oriented Programming
- Why C++?
- Features of C++
- Pros and Cons of C++

- **Chapter 2: The Language of Object-Orientation**

- What Is an Object?
- What Is a Class?
- Encapsulation
- Data Hiding
- The Public Interface
- Relationships Among Classes
- Inheritance
- Polymorphism
- Object-Oriented Design

- **Chapter 3: C vs. C++**

- Comments
- Namespaces
- Simple Output
- Simple Input
- Definitions Near to First Use
- Function Prototypes

- The `inline` Specifier
- `const`
- Structure Members
- The Reference Type
- Overloading Function Names
- Default Parameters
- The Scope Resolution Operator
- Aggregates
- Operators `new` and `delete`
- The `bool` Data Type
- The `string` Data Type

• **Chapter 4: Fundamentals of Classes**

- Data Types
- User Defined Data Types
- Using the Class Concept
- Defining a Class
- `public` and `private` Access Levels
- The Scope Resolution Operator `::`
- Using Class Objects Like Built-in Types
- Scope
- Constructors
- Member Initialization Lists
- Destructors
- Array of Objects
- Pointers
- The `this` Pointer
- Passing Objects to Functions
- Returning Objects From Functions
- `static` Class Members

• **Chapter 5: Operator Overloading**

- Introduction
- Rules for Operator Overloading
- Rationale for Operator Overloading
- Overloading Member Functions
- Overloading Non-Member Functions
- `friend` Functions
- The Copy Constructor
- The Assignment Operator

- Overloading []
- Overloading Increment and Decrement Operators
- `const` Objects and References

• **Chapter 6: Composition of Classes**

- Relationships
- Composition of Classes
- The `Point` Class
- The `Line` Class
- Member Initialization Lists
- An Application With Composition
- The Copy Constructor under Composition
- `operator=` under Composition

• **Chapter 7: Inheritance**

- Introduction
- Public Base Classes
- The `protected` Access Level
- Member Initialization Lists
- What Isn't Inherited
- Assignments Between Base and Derived Objects
- Compile-Time vs. Run-Time Binding
- `virtual` Functions
- Polymorphism
- `virtual` Destructors
- Pure `virtual` Functions
- Abstract Base Classes
- An Extended Inheritance Example

• **Chapter 8: I/O in C++**

- The `iostream` Library
- Predefined Streams
- Overloading `operator<<`
- Overloading `operator>>`
- Manipulators
- Stream States
- Formatted I/O
- Disk Files
- Reading and Writing Objects

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