عنوان دوره :	تعداد ساعت :
C++ Core	٤٠

1. **Introduction To Computer And Programming**
   - Machine Languages, Assembly Languages and High-Level Languages
   - History of C and C++
   - C++ Standard Library
   - History of Java
   - FORTRAN, COBOL, Pascal and Ada
   - Basic, Visual Basic, Visual C++, C# and .NET
   - Typical C++ Development Environment
   - Notes About C++
2. **Introduction To C++ Programming**
   - First Program in C++: Printing a Line of Text
   - Modifying Our First C++ Program
   - Another C++ Program: Adding Integers
   - Memory Concepts
   - Arithmetic
   - Decision Making: Equality and Relational Operators
3. **Control Statements**
   - Algorithms
   - Pseudocode
   - Control Structures
   - if Selection Statement
   - if...else Double-Selection Statement
   - while Repetition Statement
   - Formulating Algorithms: Counter-Controlled Repetition
   - Formulating Algorithms: Sentinel-Controlled Repetition
   - Formulating Algorithms: Nested Control Statements
   - Assignment Operators
   - Increment and Decrement Operators
   - Essentials of Counter-Controlled Repetition
   - for Repetition Statement
   - Examples Using the for Statement
   - do...while Repetition Statement
   - switch Multiple-Selection Statement
   - break and continue Statements
   - Logical Operators
   - Confusing Equality (==) and Assignment (=) Operators
   - Structured Programming Summary
4. **Functions and an Introduction to Recursion**
   - Math Library Functions
   - Function Definitions with Multiple Parameters

- Function Prototypes and Argument Coercion
- C++ Standard Library Header Files
- Case Study: Random Number Generation
- Case Study: Game of Chance and Introducing enum
- Storage Classes
- Scope Rules
- Function Call Stack and Activation Records
- Functions with Empty Parameter Lists
- Inline Functions
- References and Reference Parameters
- Default Arguments
- Unary Scope Resolution Operator
- Function Overloading
- Function Templates
- Recursion
- Example Using Recursion: Fibonacci Series
- Recursion vs. Iteration

5. Arrays and Vectors

- Arrays
- Declaring Arrays
- Examples Using Arrays
- Passing Arrays to Functions
- Case Study: Class GradeBook Using an Array to Store Grades
- Searching Arrays with Linear Search
- Sorting Arrays with Insertion Sort
- Multidimensional Arrays
- Case Study: Class GradeBook Using a Two-Dimensional Array
- Introduction to C++ Standard Library Class Template vector

6. Pointers and Pointer-Based Strings

- Pointer Variable Declarations and Initialization
- Pointer Operators
- Passing Arguments to Functions by Reference with Pointers
- Using const with Pointers
- Selection Sort Using Pass-by-Reference
- sizeof Operators
- Pointer Expressions and Pointer Arithmetic
- Relationship Between Pointers and Arrays
- Arrays of Pointers
- Case Study: Card Shuffling and Dealing Simulation
- Function Pointers
- Introduction to Pointer-Based String Processing
- Fundamentals of Characters and Pointer-Based Strings
- String Manipulation Functions of the String-Handling Library

7. **Exception Handling**
    - Exception-Handling Overview
    - Example: Handling an Attempt to Divide by Zero
    - When to Use Exception Handling
    - Rethrowing an Exception
    - Exception Specifications
    - Processing Unexpected Exceptions
    - Stack Unwinding
    - Constructors, Destructors and Exception Handling
    - Exceptions and Inheritance
    - Processing new Failures
    - Class auto_ptr and Dynamic Memory Allocation
    - Standard Library Exception Hierarchy
    - Other Error-Handling Techniques
8. **Searching and Sorting**
    - Searching Algorithms
    - Efficiency of Linear Search
    - Binary Search
    - Sorting Algorithms
    - Efficiency of Selection Sort
    - Efficiency of Insertion Sort
    - Merge Sort (A Recursive Implementation)
9. **Data Structures**
    - Self-Referential Classes
    - Dynamic Memory Allocation and Data Structures
    - Linked Lists
    - Stacks
    - Queues
    - Trees

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