Certificate Course in Java Programming (CCJP – Core Java)

Course Duration: 2 Months

Course Overview

The **Certificate Course in Java Programming (CCJP)** provides students with a solid foundation in **Core Java**, one of the most widely used and versatile programming languages. The course focuses on **object-oriented programming (OOP), Java syntax, data types, control structures, classes and objects, inheritance, exception handling, and basic GUI programming using Java**.

Learners will gain hands-on experience in **writing, compiling, and executing Java programs** and develop the problem-solving and programming skills necessary for software development, mobile applications, web development, and enterprise-level applications.

This course is ideal for **students, IT aspirants, and beginners in programming** who want to start their journey in Java and software development.

Course Objectives

By the end of this course, learners will be able to:

1. Understand the **fundamentals of Java programming and its features**.
2. Develop and execute **Java programs using variables, data types, and operators**.
3. Apply **control statements, loops, and decision-making constructs** to solve problems.
4. Understand and implement **object-oriented programming concepts in Java**.
5. Use **exception handling and basic file I/O operations** in Java programs.
6. Develop a foundation for **advanced Java programming, including GUI, networking, and database connectivity**.

Course Outcomes

After completing this course, students will be able to:

1. Write syntactically correct Java programs using **variables, operators, and expressions**.
2. Apply **loops and conditional statements** to implement problem-solving logic.

3. Design and implement **classes, objects, methods, and constructors** in Java.
4. Utilize **inheritance, polymorphism, and encapsulation** effectively.
5. Handle **exceptions and perform file operations** in Java.
6. Prepare for **advanced Java learning or entry-level Java development roles**.

Course Syllabus (Module-Wise)

Module 1: Introduction to Java

- Overview of Java – Features & Advantages
- Java Virtual Machine (JVM), JDK, JRE
- Setting up Java Development Environment
- Writing and Running First Java Program ("Hello World")

Module 2: Data Types, Variables & Operators

- Java Data Types (Primitive & Non-Primitive)
- Variables and Constants
- Operators: Arithmetic, Relational, Logical, Bitwise, Assignment
- Type Casting and Type Conversion

Module 3: Control Statements & Loops

- Conditional Statements: if, if-else, switch-case
- Loops: for, while, do-while
- break, continue, and nested loops
- Writing small programs using loops and conditions

Module 4: Arrays & Strings

- One-dimensional and Multi-dimensional Arrays
- String Class & String Handling Methods
- Practical Programs on Arrays & Strings

Module 5: Object-Oriented Programming Concepts in Java

- Classes and Objects
- Methods and Constructors
- Access Specifiers: public, private, protected, default
- this Keyword & static Keyword
- Object Creation and Memory Management

Module 6: Advanced OOP Concepts

- Inheritance: Single, Multilevel, Hierarchical
- Polymorphism: Compile-time (Method Overloading) & Run-time (Method Overriding)
- Encapsulation & Abstraction
- Interface and Abstract Classes

Module 7: Exception Handling & File I/O

- Introduction to Exceptions
- try, catch, throw, throws, finally
- Checked vs Unchecked Exceptions
- File Handling: File Class, FileReader, FileWriter, BufferedReader/Writer

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Module 8: Practical Project & Assessment

- Mini Projects integrating OOP, Exception Handling, Arrays, and File I/O
- Examples: Student Management System, Bank Management System
- Debugging and Testing Programs
- Final Assessment & Certification

☑ **Teaching Methodology:** 70% Practical, 30% Theory
☑ **Outcome:** Students will gain **hands-on experience in Core Java**, enabling them to

develop professional Java programs and build a foundation for advanced Java learning or software development careers.