



TECHNOCATION FREELANCING TRAINING INSTITUTE & SOFTWARE HOUSE

Professional Java Programming Course Outline

Module 1: Introduction to Java

- Overview of Java & Its Features
- Setting Up Java Development Environment (JDK, JRE, IDEs)
- Writing & Running Your First Java Program
- Java Virtual Machine (JVM) & Java Runtime Environment (JRE)

Module 2: Java Basics & Syntax

- Data Types, Variables & Constants
- Operators (Arithmetic, Logical, Bitwise, Relational)
- Control Statements (if-else, switch-case)
- Loops (for, while, do-while)

Module 3: Functions & Exception Handling

- Defining Methods & Function Overloading
- Recursion & Inline Methods
- Exception Handling (try, catch, finally, throw, throws)
- Custom Exception Classes

Module 4: Object-Oriented Programming (OOP) in Java

- Classes & Objects
- Constructors & Method Overloading
- Encapsulation & Access Modifiers
- Static Methods & Variables

Module 5: Inheritance & Polymorphism

- Types of Inheritance (Single, Multilevel, Hierarchical)
- Method Overriding & Dynamic Method Dispatch
- Abstract Classes & Interfaces
- The `super` & `this` Keywords

Module 6: Java Collections Framework (JCF)

- Introduction to Collections & Generic Types
- Working with Lists, Sets, and Maps
- Iterators & Streams in Collections
- Sorting & Searching Collections

Module 7: File Handling & Serialization

- Reading & Writing Files in Java
- `BufferedReader` & `BufferedWriter`
- Object Serialization & Deserialization
- Working with JSON & XML in Java

Module 8: Multithreading & Concurrency

- Introduction to Multithreading
- Thread Lifecycle & Synchronization
- Implementing `Runnable` & `Callable` Interfaces
- Thread Pools & Executors Framework

Module 9: Java Database Connectivity (JDBC)

- Introduction to JDBC & Database Connectivity
- CRUD Operations in MySQL/PostgreSQL
- Connection Pooling & Transaction Management
- Working with ORM Frameworks (Hibernate, JPA)

Module 10: Web Development with Java

- Introduction to Java Servlets & JSP
- Building RESTful APIs with Spring Boot
- Handling HTTP Requests & Responses
- Securing Web Applications with Spring Security

Module 11: Advanced Java & Frameworks

- Introduction to Spring Framework & Spring Boot

- Dependency Injection & Inversion of Control
- Microservices with Spring Cloud
- JavaFX for GUI Development

Module 12: Java for Real-World Applications

- Java for Enterprise Applications
 - Java in Android Development (Java vs. Kotlin)
 - Java for Competitive Programming & Problem-Solving
 - Performance Optimization & Best Practices
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Final Project & Certification Preparation

- Hands-on Project: Building a Complete Java Application
- Debugging & Profiling Java Code
- Preparing for Java Certification Exams (OCA, OCP)
- Java Career Opportunities & Industry Trends