Core Java Training

Duration:

- 5 days / 10 half day sessions

Prerequisites:

- Basic knowledge of any programming languages (like C or Python)
- Basic knowledge of SQL commands and concepts of RDBMS

Software requirements:

- JDK 11
- Eclipse Java EE edition (latest)
- MySQL 8.x

Detailed course outline:

Day 1:

- **Introduction to Core Java Programming and Concepts**
  - A First Look
  - A Simple Java Class
  - Java's "Hello World" Program
  - Java Basics
  - Language and Platform Features
  - Program Life Cycle
  - The Java SE Development Kit (JDK)
  - Working with the Development Environment

Day 2:

- **Class and Object Basics**
  - The Object Model and Object-Oriented Programming
  - Classes, References, and Instantiation
  - Garbage Collection
  - Adding Data to a Class Definition
  - Adding Methods (Behavior)
  - Package Overview - Using Packages to Organize Code
  - import statements
  - Creating Packages, package Statement, Required Directory Structure
  - Finding Classes, Packages and Classpath
  - More on Classes and Objects
  - Accessing data, the "this" variable
  - Encapsulation and Access Control, public and private Access
  - Constructors and Initialization
  - static Members of a Class
  - Scopes, Blocks, References to Objects
- **Composition**
  - Using Composition to Deal With Complexity
  - Composition/HAS-A, Delegation

Day 3:

- **Inheritance**

- Using Inheritance and Polymorphism to share commonality
- IS-A, extends, Inheriting Features, Overriding Methods, Using Polymorphism
- Class Object
- Abstract Classes

- **Introduction to Modules**
  - Motivation and Overview
  - Types of Modules
  - Modular JDK
  - Our Approach
- **Working with Java 9 Modules**
  - Defining and Using Modules
  - Services
  - Compatibility and Migration

Day 4:

- **Interfaces**
  - Using Interfaces to Define Types
  - Interfaces and Abstract Classes
  - Default Methods and static Methods (Java 1.8 or later only)
  - Using Interfaces to Remove Implementation Dependencies

Day 5:

- **Exceptions**
  - Exceptions and the Exception Hierarchy
  - try, catch and finally
  - Handling Exceptions
  - Program Flow with Exceptions
  - Creating user defined exceptions and exception funnelling

Day 6:

- **Java Collections and Generics**
  - The Collections Framework and its API
  - Collections and Java Generics
  - Collection, Set, List, Map, Iterator
  - Auto boxing
  - Collections of Object (non-generic)
  - Using ArrayList, HashSet, and HashMap
  - Processing items with an Iterator
  - More about generics

Day 7:

- **I/O Streams (Optional)**
  - Readers and Writers
  - Filter Streams
  - Byte Streams
  - Formatted Output

Day 8:

- **Database Access with JDBC**
  - JDBC Overview
  - JDBC Architecture
  - Drivers and types of drivers
  - DriverManager,
  - Connection,

- Statement, PreparedStatement, CallableStatement
- ResultSet
- ResultSetMetaData
- DatabaseMetaData

Day 9:

- **Additional Java Features**
  - Enums
  - Annotations
  - Local-Variable Type Inference
  - Brief Overview of Lambdas
  - Local-Variable Syntax for Lambdas

Day 10:

- Introduction to Junit and unit testing
- Understanding the test scenario
- Test boundaries
- What can be tested?
- Creating test cases
- Creating test suites