

Java SE 7 Programming

Java Platform Overview

- Introductions
- Course Schedule
- Java Overview
- Java Platforms
- OpenJDK
- Licensing
- Java in Server Environments
- The Java Community Process

Java Syntax and Class Review

- Simple Java classes
- Java fields, constructors and methods
- Model objects using Java classes
- Package and import statements

Encapsulation and Polymorphism

- Encapsulation in Java class design
- Model business problems with Java classes
- Immutability
- Subclassing
- Overloading methods
- Variable argument methods

Java Class Design

- Access modifiers: private, protected and public
- Method overriding
- Constructor overloading
- The instanceof operator
- Virtual method invocation
- Polymorphism
- Casting object references
- Overriding Object methods

Advanced Class Design

- Abstract classes and type generalization
- The static and final modifiers
- Field modifier best practices
- The Singleton design pattern
- Designing abstract classes
- Nested classes
- Enumerated types

Inheritance with Java Interfaces

- Java Interfaces
- Types of Inheritance
- Object composition and method delegation
- Implementing multiple interfaces
- The DAO design pattern

Generics and Collections

- Generic classes and type parameters
- Type inference (diamond)
- Collections and generics
- List, set and Map
- Stack and Deque

String processing

- String manipulation with StringBuilder and StringBuffer
- Essential String methods
- Text parsing in Java
- Input processing with Scanner
- Text output and formatting
- Regular expressions with the Pattern and Matcher classes

Exceptions and Assertions

- Exceptions categories
- Standard Java Exception classes
- Creating your own Exception classes
- Using try-catch and the finally clause
- Using try-with-resources and the AutoCloseable interface
- The multi-catch feature
- Best practices using exceptions
- Assertions

I/O Fundamentals

- I/O using Java
- Reading the console input stream
- Writing to the console
- Using I/O Streams
- Chaining I/O Streams
- Channel I/O
- Reading and writing objects using Serialization

File I/O with NIO 2

- The Path interface
- The Files class
- Directory and File operations
- Managing file system attributes
- Reading, writing, and creating files
- Watching for file system changes

Threading

- Operating system task scheduling
- Recognizing multithreaded environments
- Creating multi-threaded solutions
- Sharing data across threads
- Synchronization and Deadlock
- Immutable objects

Concurrency

- Creating Atomic variables
- Using Read-Write Locks
- Thread-safe collections
- Concurrent synchronizers (Semaphore, Phaser, and others)
- Executors and ThreadPools to concurrently schedule tasks
- Parallelism and the Fork-Join framework

Database Application with JDBC

- Layout of the JDBC API
- JDBC drivers
- Queries and results
- PreparedStatement and CallableStatement
- Transactions
- RowSet 1.1 RowSetProvider and RowSetFactory
- The DAO Pattern and JDBC

Localization

- Advantages of localization
- Defining locale
- Read and set locale using the Locale object
- Resource bundles
- Format messages, dates and numbers