



Java SE 7 Programming

Duration: 5 days

Course Description

This course covers the core Application Programming Interfaces (API) you will use to design object-oriented applications with Java. Learn to create classes that subclass other classes, extend abstract classes, and program with interfaces. Learn how to properly use exceptions, how to use the Collections framework, and develop applications that manipulate files, directories and file systems. This course also covers writing database programs with JDBC, and how to correctly write multi-threaded applications. Use this course to further develop your skills with the Java language and prepare for the Oracle Certified Professional, Java SE 7 Programmer Exam!

Course topics:

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