



Course Content

Course Description:

Intensive and hands-on, the course emphasizes becoming productive quickly as a Java application developer. This course quickly covers the Java 5.0 language syntax and then moves into the object-oriented features of the language. Students will then use several of the provided API packages, such as I/O streams, collections, Swing GUI programming, threads, and accessing a database with JDBC. The course ends with a chapter on performance tuning with hints and best practices for writing efficient applications. Appendices on sockets, regular expressions and J2EE are also available for further study.

Prerequisites:

Professional programming experience in C, C++ or C# is required. Knowledge of object-oriented concepts is required.

Topics:

Course Introduction

- Course Objectives
- Course Overview
- Using the Workbook
- Suggested References

Getting Started with Java

- What is Java?
- How to Get Java
- A First Java Program
- Compiling and Interpreting Applications
- The JSDK Directory Structure

Eclipse

- Introduction to Eclipse
- Installing Eclipse
- Running Eclipse for the First Time Editors, Views, and Perspectives
- Setting up a Project
- Creating a New Java Application
- Running a Java Application
- Debugging a Java Application
- Importing Existing Java Code into Eclipse

Language Fundamentals

- A Java Program
- If Statements
- Switch Statements
- Loop Statements
- Syntax Details
- Primitive Datatypes
- Variables
- Expressions in Java
- Strings, Arrays and Enhanced for Loop

Objects and Classes

- Defining a Class
- Creating an Object
- Instance Data and Class Data
- Methods
- Constructors
- Access Modifiers
- Encapsulation

Using Java Objects

- Printing to the Console; Printf Format Strings
- StringBuilder and String Buffer; Methods and Messages; ToString
- Parameter Passing; Comparing and Identifying Objects



Java Programming – Introduction

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35 Hrs

- Destroying Objects; Using the Primitive-Type Wrapper Classes
- Enumerated Types

Inheritance in Java

- Inheritance; Inheritance in Java
- Casting; Method Overriding
- Polymorphism; super
- The Object class

Advanced Inheritance and Language Constructs

- Abstract Classes;
- Interfaces; Using Interfaces
- Collections; Generics
- Comparable

Packages

- Packages; The Import Statement
- Static Imports
- CLASSPATH and Import; Defining Packages
- Package Scope

Exception Handling

- Exceptions Overview; Catching Exceptions; The Finally Block
- Exception Methods; Declaring Exceptions
- Defining and Throwing Exceptions
- Errors and Runtime Exceptions

Input/Output Streams

- Overview of Streams; Bytes vs. Characters
- Converting Byte Streams to Character Streams
- File Object; Binary Input and Output
- PrintWriter Class
- Reading and Writing Objects
- Closing Streams

Core Collection Classes

- The Collections Framework; The Set Interface
- Set Implementation Classes
- The List Interface; List Implementation Classes
- The Queue Interface
- Queue Implementation Classes
- The Map Interface; Map Implementation Classes

Collection Sorting and Tuning

- Sorting with Comparable and Comparator
- Sorting Lists and Arrays
- Collections Utility Methods; Tuning ArrayList;
- Tuning Hashmap and HashSet

Inner Classes

- Inner Classes; Member Classes; Local Classes
- Anonymous Classes
- Instance Initializers
- Static Nested Classes

Introduction to Swing

- AWT and Swing; Displaying a Window
- GUI Programming in Java
- Handling Events; Arranging Components
- A Scrollable Component
- Configuring Components
- Menus; Using the JFileChooser

Swing Events and Layout Managers

- The Java Event Delegation Model
- Actions Events; List Selection Events; Mouse Events
- Layout Managers; Border Layout; Flow Layout; Grid Layout; Box Layout; Box
- JtabbedPane

Introduction to JDBC

- The JDBC Connectivity Model
- Database Programming
- Connecting to the Database
- Creating a SQL Query; Getting the Results
- Updating the Database Data; Finishing Up

JDBC SQL Programming

- Error Checking and the SQLException Class
- The SQLWarning Class
- JDBC Types; Executing SQL Queries
- ResultSetMetaData
- Executing SQL Updates;
- Using a PreparedStatement; Parameterized Statements; Stored Procedures; Transaction Management



Appendix A - Introduction to Threads

- Non-Threaded Applications; Threaded Applications; Creating Threads
- Thread States; Runnable Threads; Coordinating Threads
- Interrupting Threads; Runnable Interface; Thread Groups

Appendix B - Thread Synchronization and Concurrency

- Race Conditions; Synchronized Methods; Deadlocks
- Synchronized Blocks; Synchronized Collections
- Thread Communication—Wait()
- Thread Communication_notify()
- Executor; Callable

Appendix C

- JDBC SQL Escape Syntax
- The execute() Method
- Batch Updates
- Updateable Result Sets
- Large Objects
- Working with Savepoints
- RowSets
- CachedRowSet
- DataSources

Appendix d

- Shortcut Key Sequences
- More Shortcut Key Sequences