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
• 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; Caching 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