Introduction to Java Programming

Intensive and hands-on, the course emphasizes becoming productive quickly as a Java™ application developer. This course quickly covers the Java language syntax and then moves into the object-oriented features of the language. Students will then learn the I/O streams and collections API packages. This course is current to Java 7 and uses the Eclipse IDE.

Course Objectives:

- Write stand-alone applications using the Java language.
- Accurately implement Object-Oriented concepts using Java features, such as classes, interfaces, and references.
- Create well-scoped classes using packages and inner classes.
- Write programs which both handle and create exceptions.
- Read and write data, using input and output streams.
- Use the Java Collections Framework to work with groups of objects.

Audience: Programmers moving to object-oriented programming using Java.

Prerequisites: Professional programming experience in C, C++, or C# required. Knowledge of Object-Oriented concepts is required.

Number of Days: 3 days

1 Course Introduction

Course Objectives
Overview
Using the Workbook
Suggested References

2 Getting Started with J2SE

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

3 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

4 Language Fundamentals

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

5 Objects and Classes

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

6 Using Java Objects

Printing to the Console

printf Format Strings
StringBuilder and StringBuffer
Methods and Messages
toString
Parameter Passing
Comparing and Identifying Objects
Destroying Objects
The Primitive-Type Wrapper Classes
Enumerated Types
7 Inheritance in Java
Inheritance
Inheritance in Java
Casting
Method Overriding
Polymorphism
super
The Object Class
8 Advanced Inheritance and Generic
Abstract Classes
Interfaces
Using Interfaces
Collections
Generics
Comparable
9 Packages
Packages
The import Statement
Static Imports
CLASSPATH and Import
Defining Packages
Package Scope
10 Exception Handling
Exceptions Overview
Catching Exceptions
The finally Block
Exception Methods
Declaring Exceptions
Defining and Throwing Exceptions
Errors and RuntimeExceptions
11 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
12 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
13 Appendix A – Collection Sorting and Tuning
Sorting with Comparable
Sorting with Comparator
Sorting Lists and Arrays
Collections Utility Methods
Tuning ArrayList
Tuning HashMap and HashSet
14 Appendix B – Java EE Overview
Introduction to Java EE
Java SE Building Blocks
Web Applications
Web Services
Enterprise JavaBeans
Additional J2EE APIs
POJO, Dependency Injection, and Annotations
The Java EE Platform
15 Appendix C – Eclipse Shortcuts
Shortcut Key Sequences
More Shortcut Key Sequences