

This course is paced to provide a solid foundation in Java™ for programmers without syntax experience in a C-based language. Intensive and hands-on, the course emphasizes becoming productive quickly as a Java programmer. Besides learning the basic structure and syntax of the language, students will also learn object-oriented principles and how they are applied in Java applications. The course then covers 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.
- 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 a high level language, such as COBOL and Visual Basic.

Number of Days: 4 days

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| 1 | <p>Course Introduction Course Objectives Course Overview Using the Workbook Suggested References</p> | | <p>Importing Existing Java Code into Eclipse</p> |
| 2 | <p>Getting Started with Java What is Java? How to Get Java A First Java Program Compiling and Interpreting Applications The JDK Directory Structure</p> | 4 | <p>Datatypes and Variables Primitive Datatypes Declarations Variable Names Numeric Literals Character Literals String String Literals Arrays Non-Primitive Datatypes The Dot Operator</p> |
| 3 | <p>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</p> | 5 | <p>Operators and Expressions Expressions Assignment Operator Arithmetic Operators Relational Operators Logical Operators Increment and Decrement Operators Operate-Assign Operators (+=, etc.)</p> |

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|-----------|--|-----------|--|
| | The Conditional Operator | | Parameter Passing |
| | Operator Precedence | | Comparing and Identifying Objects |
| | Implicit Type Conversions | | Destroying Objects |
| | The Cast Operator | | Using the Primitive-Type Wrapper Classes |
| 6 | Control Flow | | Enumerated Types |
| | Statements | | 11 Inheritance in Java |
| | Conditional (if) Statements | 11 | Inheritance |
| | Adding an else if | | Inheritance in Java |
| | Conditional (switch) Statements | | Casting |
| | while and do-while Loops | | Method Overriding |
| | for Loops | | Polymorphism |
| | A for Loop Diagram | | super |
| | Enhanced for Loop | | The Object Class |
| | The continue Statement | | 12 Advanced Inheritance and Generics |
| | The break Statement | 12 | Abstract Classes |
| 7 | Methods | | Interfaces |
| | Methods | | Using Interfaces |
| | Calling Methods | | Collections |
| | Defining Methods | | Generics |
| | Method Parameters | | Comparable |
| | Scope | | 13 Packages |
| | So, Why All the static? | 13 | Packages |
| 8 | Object-Oriented Programming | | The import Statement |
| | Introduction to Object-Oriented Programming | | Static Imports |
| | Classes and Objects | | CLASSPATH and Import |
| | Fields and Methods | | Defining Packages |
| | Encapsulation | | Package Scope |
| | Access Control | 14 | Exception Handling |
| | Inheritance | | Exceptions Overview |
| | Polymorphism | | Catching Exceptions |
| | Best Practices | | The finally Block |
| 9 | Objects and Classes | | Exception Methods |
| | Defining a Class | | Declaring Exceptions |
| | Creating an Object | | Defining and Throwing Exceptions |
| | Instance Data and Class Data | | Errors and RuntimeExceptions |
| | Methods | 15 | Input/Output Streams |
| | Constructors | | Overview of Streams |
| | Access Modifiers | | Bytes vs. Characters |
| | Encapsulation | | Converting Byte Streams to Character Streams |
| 10 | Using Java Objects | | File Object |
| | Printing to the Console | | Binary Input and Output |
| | printf Format Strings | | PrintWriter Class |
| | StringBuilder and StringBuffer | | Reading and Writing Objects |
| | Methods and Messages | | Closing Streams |
| | toString | | |

- 16 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
- 17 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
- 18 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 J2EE Platform
- 19 Appendix C – Eclipse Shortcuts**
 - Shortcut Key Sequences
 - More Shortcut key Sequences