

## **Intro to Java Programming for Object Oriented Developers**

- **Course Number:** IntJava-OO
- **Length:** 5 Day(s)

### **Certification Exam**

There are no exams associated with this course.

### **Course Overview**

This course uses a combination of instructor lectures, computer demonstrations and interactive hands-on lab simulations to illustrate the major language constructs of Java. Topics discussed include; defining variables, static and instance methods, data abstraction, iterative looping and conditionals, building class definitions, exception handling, single and multidimensional arrays, defining Class definitions, inheritance and polymorphic behavior, Exception handling and JDBC concepts.

### **Prerequisites**

Basic knowledge of programming and Java programming language is required.

### **Audience**

This course is intended for software developers using Java programming language.

### **Course Outline**

- Level 1
- Learning the Java Environment
- What is the Java Language?
- Java Language Background
- Java Language Benefits
- Types of Java Programs
- Defining a Java Applet
- Defining a Java Application
- Defining a Java Servlet
- Java Runtime Environment
- Java Development Environment
- Biggest Benefit: Portability
- Portability Benefits
- The Java Language
- Java Libraries
- Java API Hierarchy
- Object-Oriented vs. Procedural
- Language Attributes
- History of OO Programming
- Java and OO Concepts
- OO Concept: Abstraction
- OO Concept: Encapsulation
- OO Concept: Polymorphism
- OO Concept: Inheritance

- What are Objects?
- OO Programming in Java
- Object Architecture
- Objects and Classes
- Viewing a Class Definition
- Creating Java Class Definition
- Data Hiding in Java
- Inheritance: Class & Subclasses
- OO Program Structure
- New Objects: Constructors
- Java Platform Separation
- J2EE Architecture
- Illustrating J2EE
- J2SE Platform
- J2EE Packaging
- Demo - Eclipse SDK 3.1
- Chapter 1 Review
- Level 2
- Eclipse IDE
- Understanding Eclipse
- Eclipse Architecture
- Java Development
- Eclipse Window
- Workbench Window
- Workbench Wizards
- Role of Eclipse Projects
- Project Creation
- Eclipse Folder Structure
- Java Project Folder
- Demo - Exploring Eclipse
- Importing Projects
- Demo - How to Import Projects
- Eclipse Perspective
- Utilizing Perspectives
- Selecting Perspectives
- Java Perspective
- Java Browsing Perspective
- Debug Perspective
- Demo - Perspectives
- Common Views: Navigator & Editor
- Eclipse Prefs & Java Code Formatting
- Workbench Preferences
- Managing File Editors
- Workbench Preferences: File Editors
- Demo - Eclipse Preference Settings
- Illustrating Java Editor
- Search Operations
- Java IDE
- Eclipse Java Decomposition
- Incremental Compilation
- Illustrating Debugger Role
- Demo - Eclipse Debugger

- Workbench Exports
- Lab - Working with Eclipse
- Chapter 2 Review
- Level 3
- Defining & Declaring Variables
- Java Variables
- Java Primitive Data Types
- Java Integer Data Types
- Integer Internal Representation
- Declaring Integer Variables
- Assignment Statement
- Demo - Integer Variable Types
- Arithmetic Calculations: Binary Operator
- Arithmetic Calculations: Unary Operator
- Integer Division with Remainders
- Increment and Decrement
- Implicit Type Conversion
- Explicit Casting
- Floating Point Data Types
- Floating Point Variables
- Floating Point Calculations
- Using the Modulus Operand
- Explicit Casting: Floating Point
- Storing Characters in Java
- Character Arithmetic
- Boolean Variables
- String Variables
- Lab - Defining Variables
- Chapter 3 Review
- Level 4
- Decision Logic & Looping
- Java Comparison Operators
- Comparison Operators and Booleans
- Simple if Statement
- Use of Statement Blocks
- True/False using else
- Sample else Conditional
- Completed Java Program
- Statement by Statement Examination
- Nested if Statements
- Demo - Java Conditional
- Boolean Operators
- Using Conditional AND
- Conditional OR Operand
- Demo - Conditional AND
- Using the NOT Operand
- Booleans in Combinations
- Using Conditional Operators
- Example of Ternary Operators
- The continue Statement
- Use of switch Expression
- Using switch Option

- Switch Without break Statements
- Stacking case Statements
- Demo - Switch Case Statement
- Using the for Loop in Java
- Example of the for Loop
- Sample of a for Loop
- Demo -for Loop
- Using the while Loop in Java
- Example of the while Loop
- Sample of a while Loop
- Using the dowhile Loop
- Example of the dowhile Loop
- Sample of a dowhile Loop
- Nesting Iterative Loops
- Use of the continue Statement
- Example of the continue Statement
- Using Labels with continue
- Use of the break Statement
- Example of the break Statement
- Demo - Iterative Processing
- Lab - Conditionals
- Chapter 4 Review
- Level 5
- Illustrating Class Definitions
- Illustrating a Class
- Class Variables
- Instance vs Class Variables
- Methods and Class Definitions
- Class Definition
- Defining Methods
- Parameter Lists
- Method Calls in Static Methods
- How Arguments are Passed
- Accessing Methods & Variables
- Class Method Definitions
- Instance Method Definitions
- Initialize Instance Variables
- Use of Initialization Blocks
- Defining a Constructor
- Create Objects with Constructor
- Declaring Variables vs Objects
- Demo - Employee Class Definition
- Demo - Employee Constructor
- Using Constructors
- Passing Objects to Methods
- Demo - Passing Java Objects
- Constructors & Method Overloading
- Multiple Vehicle Constructors
- Using Multiple Constructors
- Constructor to Constructor Calls
- Understanding Java Packages
- Compiling using Packages

- Using Java Extensions
- Creating .jar Files
- Using Package Classes
- Class Access Options
- Class Access within Package
- Access from Different Packages
- Demo - Using Import Statement
- Lab - Class Definition
- Chapter 5 Review
- Level 6
- Java Arrays
- What is an Array?
- Declaring an Array
- Accessing Array Elements
- Using an Array
- Demo - Defining & Initializing an Array
- MultiDimensional Arrays
- Sample MultiDimensional Array
- Lab - Java Arrays
- Chapter 6 Review
- Level 7
- Defining Inheritance
- Defining Derivation
- Using Derivation in Java
- What is Class Inheritance
- Inherited Methods
- Derived Class Objects
- Class Derivation Example
- SubClass Constructors
- Overriding Base Methods
- Base Class Access Attributes
- Demo - Java Inheritance
- What is Polymorphism?
- Polymorphism Conditions
- Using Polymorphism
- Execute Polymorphic Application
- View of Derived Object
- Demo - Polymorphism
- Abstract Classes
- Abstract Example
- Use of final with Methods
- Use of final with Class
- Universal SuperClass Concept
- Object Protected Methods
- Using toString() Method
- getClass Inherited Method
- What are Interfaces
- Defining Class Interfaces
- Benefits of Interfaces
- Implementing Interfaces
- Implement Interface Methods
- Summary of Interfaces

- Demo - Interfaces
- Lab - Inheritance
- Chapter 7 Review
- Level 8
- Eclipse Debugger
- Illustrating the Debugger Role
- Debugging in WSAD
- Debugger Features
- Debug Panel
- Demo - Debugger Overview
- Setting Debugging Preferences
- Debug Filters
- Debug Preferences
- Debug Preferences: Console
- Demo - Eclipse Debugger Settings
- Starting Debugger
- Debug Source Panel
- Suspended Thread
- Controlling Execution
- Viewing Variables
- Using Expressions
- Setting Breakpoints
- Role of Breakpoints
- Viewing Breakpoints
- Breakpoint Properties
- Exceptions Panel
- Lab - Debugger
- Chapter 8 Review
- Level 9
- Exception Handling
- What is an Exception?
- Different Types of Exceptions
- Error Subclasses
- Exception Classes
- RuntimeException Errors
- Exception Handling in Java
- Defining Exceptions to Throw
- Handling Method Exceptions
- Using try Block
- Using catch Block
- Try/Catch Block Example
- Demo - Try/Catch Block
- Try/Catch Block with Loop
- Demo - Try/Catch Block with Loop
- Multiple catch Blocks
- Using finally Block
- Exception Handling Summary
- Demo -finally Block
- Normal Execution Pattern
- Exception Execution Pattern
- Exception Not Caught
- Rethrowing Exceptions

- Throwable Class
- Using Throwable Class
- Demo - Exception Types
- Defining an Exception Class
- Throwing your Exceptions
- Lab - Exception Handling
- Chapter 9 Review
- Level 10
- Database Concepts
- JDBC Accessing
- Illustrating JDBC API
- Java Application Perspective
- Role of DBMS Driver
- Thick vs. Thin JDBC Drivers
- Type 1: Bridge Driver
- Type 2: Native API
- Type 3: Network Driver
- Type 4: Native Driver
- Comparing JDBC Versions
- JDBC Architecture
- Build Connection Object
- Basic JDBC Logic Flow
- Defining a Database Driver
- Demo - Defining a Connection Object
- DriverManager in JDBC
- Connecting to a Datasource
- Sample Connection
- Username/Password
- Defining a Statement
- Demo - Statement Object
- Prepared SQL Statement
- Exploring ResultSet Object
- Accessing ResultSet Object
- Demo - ResultSet Object
- Processing ResultSet Table
- JDBC Data Type Conversions
- Demo - ResultSet Processing
- Lab - JDBC Access
- Chapter 10 Review
- Level 11
- Thread Management
- What is a Thread
- Thread Utilization in Java
- Illustrating Threads
- Java Thread Illustration
- Thread Illustration View
- Thread Lifecycle
- Thread Creation
- Demo - Thread Execution
- Thread Controls
- Thread Control Methods
- Demo - Thread Interruption

- Define Thread Subclass
- Sample of Thread Subclass
- Thread Characteristics
- Daemon and User Threads
- Creating Thread Objects
- Implementing the run method
- Stopping a Thread
- Additional Thread Methods
- Demo - Runnable Interface
- MultiTasking vs MultiThreading
- Sample Non-Threaded Example
- Sample Thread Example
- Thread Synchronization
- Synchronize Example
- Thread Scheduling
- Illustrating Synchronized
- Defining Deadlocks
- Lab - Threads
- Chapter 11 Review
- Level 12
- Files and Streams
- What is a Stream?
- Stream Input/Output Operations
- Defining a File
- Testing File Objects
- Sample Using File
- Demo - File Object Creation
- Accessing File Objects
- Demo - File Handling
- Modifying File Objects
- Using Directory Methods
- Using Attribute Methods
- Using Creation Methods
- Using Deletion Methods
- Demo - File Directory
- Subclasses of OutputStream
- Defining OutputStream Methods
- Using FileOutputStream Class
- Using the FileOutputStream
- ByteArrayOutputStream
- Demo - Data Output Stream
- Using DataOutputStream Class
- Buffered Output Stream
- Create Buffered Output Stream
- Demo - Buffered Ouput
- Lab - File Management
- Chapter 12 Review
- Course Closure