Java Essentials Training

Java 6 Programming Fundamentals for Developers New to OO
(C, COBOL, Mainframe, 4GL, etc.)

Course Overview

Java 6 Programming Fundamentals for Developers New to OO is a five-day, comprehensive hands-on Java training course geared for developers who have little or no prior working knowledge of object-oriented programming languages (such as those working on (C, COBOL, 4GL, etc.) Throughout the course students learn the best practices for writing great object-oriented programs in Java 6, using sound development techniques, new improved features for better performance, and new capabilities for addressing rapid application development. Special emphasis is placed on object oriented concepts and best practices.

In addition to the normal exercises that are liberally sprinkled throughout the course, our additional case study covers the entire spectrum from use cases to object-oriented design to implemented classes. This case study supplements the course and can be used during and after the course as a reference and a tool for reviewing and practicing what was learned in class.

Course Snapshot	
Course	**TT2120 Java 6 Programming Fundamentals for Developers New to OO (C, COBOL, Mainframe, 4GL)**
Duration	5 days
Skill Level	Introductory
Focus	Java 6 Applications
Audience	Experienced programmers with little to no Object Oriented background (such a C, COBOL or 4GL programmers).
Pre-Requisites	This is a **beginner** level Java course, designed for experienced developers who wish to get up and running with Java, or who need to reinforce sound Java coding practices, immediately. Attendees should have a working knowledge of developing software applications.
Course Format	Extensive hands-on programming labs; Expert lecture combined with open discussions and high-level demonstrations. Student machines are required.
Language/Tools	Java 6 delivered with most IDEs: IBM Rational Application Developer (RAD), Oracle JDeveloper, Eclipse and more. Course is also offered for Java 5.
Delivery Format	Available for onsite private classroom presentation, or live online/virtual presentation. This course is also available on our Public Course Schedule.
Customizable	Yes. This course may be easily tailored to best suit your training skills objectives, tools of choice and learning goals.
GSA Schedule?	Yes. Trivera Technologies is a 100% Female-Owned Small Business Concern, holding GSA Schedule #GS-35F-0188T. Please contact us for GSA rates, or to team with us for your small-business set aside opportunities.

This Course is Available for:	Onsite Private Training	Online / Virtual Training	Trivera Public Schedule	Courseware Can Be Purchased	Content is Customizable
	☑	☑	☑	☑	☑

Course Objectives: What You'll Learn

Working within a dynamic, hands-on learning environment led by our expert practitioner, attendees will learn to:

- Understand what OO programming is and what the advantages of OO are in today's world
- Work with objects, classes, and OO implementations
- Understand the basic concepts of OO such as encapsulation, inheritance, polymorphism, and abstraction
- Understand not only the fundamentals of the Java language, but also it's importance, uses, strengths and weaknesses
- Understand the basics of the Java language and how it relates to OO programming and the Object Model
- Learn to use Java exception handling and logging features
- Understand and use classes, inheritance and polymorphism
- Understand and use collections, generics, autoboxing, and enumerations including new Java 6 features and capabilities
- Use the JDBC API for database access
- Use Java for networking and communication applications
- Work with annotations
- Take advantage of the Java tooling that is available with the programming environment being used in the class

If your team requires different Java topics, skills or subjects, this course may be easily adjusted to accommodate, at no additional cost. Please inquire for details.

Course Structure: Experiential Learning; Hands-On Labs

Throughout the course students will be led through a series of progressively advanced topics, where each topic consists of lecture, group discussion, comprehensive hands-on lab exercises, and lab review. This course is "skills-centric", designed to train attendees in essential Java development skills, coupling the most current, effective techniques with the soundest coding practices.

This course is about **50% hands-on lab and 50% lecture,** providing over **30 basic and challenges labs** for students to work through during the class, designed to reinforce fundamental skills and concepts learned in the lessons. Our courses include ample materials and labs to ensure all students are either appropriately challenged, or assisted, at all times – no matter their skill level. At the end of each lesson, developers will be tested with a set of review questions to ensure that he/she has fully understands that topic.

Audience & Pre-Requisites: Who Should Attend

This is a **beginner** level Java course, designed for experienced developers who wish to get up and running with Java, or who need to reinforce sound Java coding practices, immediately. Attendees should have a working knowledge of developing software applications.

Related Courses: Suggested Learning Path

Take Instead: We offer other courses that provide different levels of knowledge or focus:

- For the OO Experienced: **TT2100 Java Programming Fundamentals for OO Developers**
- For a server-side flavor – intro to Java combined with JEE basics: **TT5140 Java Programming Essentials for Server-Side/JEE Developers New to OO**

Take After: We offer a variety of introductory through advanced development, project management, engineering, architecture and design courses.

- Students wishing to extend their newly learned OO foundation skills should consider **TT1130 Object-Oriented Analysis & Design Using UML 2.x**
- Students needing an essential JEE follow up may take **TT5100 Enterprise Java / JEE Web Applications Essentials** (Servlets/JSPs, Tags, JDBC, Security, etc.)
- Essential Java, JEE or web development training topics
- Agile or test-driven development topics
- Please contact us for recommended next steps tailored to your longer term education, project or development objectives.

Course Topics: High Level List / Agenda

Session Java: A First Look

Lesson Using the JDK

- Setting Up Environment
- The Development Process
- Locating Class Files
- Compiling Package Classes
- Source and Class Files
- Applications and Applets

Lesson Writing a Simple Class

- Classes in Java™
- What Is a Class?
- Defining the Class
- Class Modifiers
- Class Instance Fields
- Instance Fields Diagram
- Primitives vs. Object References
- Creating Objects
- The main Method
- Using the Dot Operator
- Writing Output

Lesson The Java™ Platform

- Defining Java
- Java Provides Several Platforms
- Note on Terminology
- Java SE 6
- Java SE Development Kit (JDK)
- Executing Programs
- Lifecycle of a Java Program
- Responsibilities of JVM
- Java is Dynamic: The Runtime Process
- Primary Areas of the JVM Runtime
- Garbage Collection
- Documentation and Code Reuse
- JavaDoc Provides Documentation Delivery
- In-Line Comments are Translated into HTML Rendering
- Working with Java in Your Environment

Session Introduction to OO Concepts

Lesson OO Programming

- The Object Oriented Way
- Real-World Objects
- Classes and Objects
- Examples of Classes and Objects
- Classes and Objects Diagram
- Object Behavior
- Methods and Messages

Lesson Classes and Objects

- Concepts, Entities, Classes & Objects
- Classes
- Responsibilities and Operations
- Abstractions and Responsibilities
- Instantiation
- Instances
- Objects Provide a Service
- Messages and Objects
- Encapsulation
- Layered Architecture

Lesson Inheritance, Abstraction, and Polymorphism

- Encapsulation
- Inheritance
- Method Overriding
- Aggregation
- Type Abstraction – Grouping as Supertype
- Polymorphism
- Polymorphism Diagram

Session Getting Started with Java™

Lesson Adding Methods to the Class

- Instance Methods
- Passing Parameters Into Methods
- Returning a Value From a Method
- Overloaded Methods
- Overloaded Methods Diagram
- Constructors
- Defining a Constructor
- Optimizing Constructor Usage

Lesson Language Statements

- Operators
- Comparison and Logical Operators
- Looping: The for Statement
- Looping: The while Statement
- Looping: The do Statement
- Continue and Break Statements
- The switch Statement

Lesson Using Strings

- Strings
- String Method
- String Equality
- StringBuffer
- Strings, StringBuffer, and StringBuilder
- StringTokenizer
- Scanner
- Scanner - File Source
- Scanner - Getting Input
- Scanner - Testing for Tokens
- Scanner - Patterns for Tokens
- Formatter
- Formatter – Probable First Encounters
- Formatter – StringBuffer

Lesson Specializing in a Subclass

- Extending a Class
- The extends Keyword
- Casting
- Overriding Superclass Methods
- Method Overriding Diagram
- Calling Superclass Methods from Subclass
- The Object Class
- The equals Method
- Default Constructor
- Implicit Constructor Chaining
- Passing Data Up Constructor Chain
- A Common Programming Mistake
- Editing Tools in Your IDE

Session Essential Java™ Programming

Lesson Fields and Variables

- Fields vs. Variables
- Data Types
- Default Values
- Block Scoping Rules
- Using this
- Final and Static Fields
- Static Variable Diagram

Lesson Using Arrays

- Arrays
- Accessing the Array
- Multidimensional Arrays

Lesson Static Methods and Fields

- Static Fields
- Simple Example of Static Fields
- Static Methods

Lesson Java™ Packages

- The Problem
- Packages
- Class Location of Packages
- The Package Keyword
- Importing Classes
- Executing Programs
- Visibility
- Java Naming Conventions
- Packages Diagram
- Refactoring in Your IDE

Session Advanced Java™ Programming

Lesson Inheritance and Polymorphism

- Polymorphism
- Polymorphism: The Subclasses
- Treating Derived Classes as the Superclass
- Casting to the Derived Class
- Using instanceof For Downcasting
- Upcasting vs. Downcasting
- Calling Superclass Methods From Subclass
- The final Keyword

Lesson Interfaces and Abstract Classes

- Separating Capability from Implementation
- Abstract Classes
- Shape as an Abstract Class
- Polymorphism With Abstract Classes
- Interfaces
- Implementing an Interface
- Extending Interfaces
- Polymorphism With Interfaces
- Type Checking
- Abstract Classes vs. Interfaces
- Interfaces Diagram

Lesson Exceptions

- What is an Exception?
- Exception Architecture
- Handling Exceptions
- The Throwable Class
- The try Block
- The catch Block
- The finally Block
- Full Example of Exception Handling
- Generalized vs. Specialized Exceptions
- Overriding Methods
- Creating Your Own Exceptions
- Throwing Exceptions
- Re-throwing an Exception
- Checked vs. Unchecked Exceptions
- Debugging in Your IDE

Session Java™ Developer's Toolbox

Lesson Utility Classes

- Wrapper Classes
- The Number Class
- Numbers and Strings
- Big Decimal
- Random Numbers
- Decimal Formatting
- The Date Class

Lesson Vector and Hashtable

- The Vector Class
- Creating and Using a Vector
- Java Collections Methods in Vector
- Hashtables
- Understanding How Hashing Works
- Creating and Using a Hashtable
- Performing Lookups

Lesson Collections

- The Collections Framework
- Collections Feature Types

- Collections Interface Hierarchy
- Map Interfaces
- Optional Methods
- The Collection Interface
- Iterators
- The Set Interface
- SortedSet
- Set and SortedSet Example
- Comparable and Comparator
- The List Interface
- List Example
- ListIterator
- Queue Interface
- QueueExample
- BlockingQueue
- BlockingQueue Implementations
- Collections Utility Methods
- Features of the Implementation Classes
- Synchronization Wrappers
- Feature Comparison
- Using the Right Collection
- Use of Collections vs. Vector/Hashtable
- Optimizing Collection Constructors
- Copying Arrays
- Creating and Using an ArrayList
- Creating and Using a HashMap

Lesson Generics

- Generics and Parametric Polymorphism
- Simple Generics
- The Mechanics of Generics
- Generics and Subtyping
- Compiler Restrictions on Generics and Subtyping
- Generics as Arguments in Methods
- Rationale Behind Wildcards
- Wildcards In Use
- Regular Wildcards in Method Parameters
- Bounded Wildcards
- Standard Rules Apply
- Generic Methods
- Interoperability with Legacy Code
- Raw Types
- Legacy Calls To Generics
- When Generics Should Be Used
- Build Paths in Your IDE

Lesson Overview of Java GUIs

- JFC – Java Foundation Classes
- Categories of Classes in JFC
- Creating the Frame
- Adding Content to a Frame
- A Closer Look at Layout Managers
- BorderLayout
- JFC Provides an Event Handling Structure

Lesson JDBC ™

- What is JDBC?
- Structured Query Language (SQL)
- Connecting to the Database
- Statements
- Statement and PreparedStatement
- ResultSet
- JDBC Diagram
- Executing Inserts, Updates, and Deletes
- Controlling Transactions and Concurrency
- Mapping SQL Types to Java Types
- Database Connection Via JDBC Calls
- Rationale for Connection Pooling
- Connection Pooling in JDBC
- Database Connection Using a DataSource
- Stored Procedures Defined
- Callable Statement Syntax
- Stored Procedure Parameters
- RowSet Implementations
- JDBCRowSet
- JDBCRowSet Approach
- JDBCRowSet – Retrieving Data
- JDBCRowSet Example
- CachedRowSet
- CachedRowSet Approach
- CachedRowSet Example

Lesson Java Logging

- Why Logging?
- Logging Framework
- Logging in Java
- Java Logging Framework
- The Logger Class
- Global Configuration
- Logging Levels
- Programmatically Setting Logging Properties
- Programmatic Handlers
- Formatters
- Logging Security & Performance

***LABS**: There are over 30 hands-on lab exercises and challenges laced throughout this course. Please ask us for lab details.*

***Case Study:** A complete case study provides an incremental series of labs covering requirements analysis, design, implementation, and refactoring. A complete set of solutions are also included, enabling the case study to be used after class as a homework assignment, tool for review, or a reference.*

***Need more details?** Please note that a more detailed outline of the course table of contents, lists of lab exercises and project descriptions is available. Please contact us at Training@triveratech.com for info.*

***Need courseware?** This course is fully customizable, and also available for license with complete support for qualified organizations. Please contact Courseware@triveratech.com for details.*

Student Materials & Classroom Setup: What You'll Receive

Our robust course materials include much more than a simple slideshow presentation handout. Student materials include a comprehensive hard-copy course manual, complete with detailed course notes, code samples, diagrams and current reference materials, all directly related to the course at hand, indexed for ease of use. Step-by-step lab instructions and project descriptions are clearly illustrated and commented for maximum learning. Our course kits are designed to serve as an excellent and useful reference set, long after we leave your classroom.

Set up made simple! For hands-on course deliveries using open-source tools (such as JBoss or Eclipse), we'll provide our unique ***LoadNGo Instant Classroom Setup Kit***, which enables students to run the entire course off of our custom, course-specific DVD that hosts the entire course set up software, labs, and other pertinent useful educational resources, whitepapers, tutorials and more. Your firm simply provides

the hardware and appropriate O/S, and we'll do the rest. **Great for secure environments.** Minimum set up burden for your team or firm, with maximum results for your students.

No matter which set up option or software your firm requires, we're pleased to provide a detailed set up guide for all private or on-site courses, and as much assistance as you require to prepare your students or classroom for the course. Our support personnel and instructors can be contacted for any advice you may require to prepare your classroom and/or students for attendance.

Collaborative Mentoring & Extended Learning Services

Trivera's team of technical experts is available to help your team apply their newly-learned classroom skills to their real-world role in a meaningful, practical way, right after the training ends. This may be especially helpful for COBOL and Mainframe students moving to object-oriented and web based technologies, which can be an overwhelming prospect for both students and their organizations. Our custom **Collaborative Mentoring Programs** are structured to help students implement these skills into their existing (or inherited) legacy projects, or into new pending projects, working with our trusted expert to help guide them along. Working with an experienced mentor allows them to exercise their skills with confidence, while minimizing the technical risk for their organization.

Trivera also offers custom **Extended Learning Programs** that can serve as 'check-points' or additional learning support for students after the training ends. Designed in collaboration with your firm and tuned to your organizations longer term learning goals, these programs can include elements that are developed, executed and managed by our team such as guided reading assignments; guided discussion groups; independent projects and case study work that require milestone based activities and reviews; interim quizzes; live discussions or other elements that will help monitor your students' progress and help to fill gaps where needed. These programs can be can be highly involved and closely integrated with your project timelines or group development efforts, or can be less involved, serving simply as an overarching educational framework or 'spot check' to keep your group skills moving forward in between projects or waiting for projects to begin. Please contact us for details about this exciting custom service.

Why Choose to work with Us? What make Trivera Technologies Unique…

Whether you are a project leader choosing a training provider or course to bring to your team, or an organization or an instructor looking to potentially license or use course materials to train your own team, or a student looking for an exciting, targeted training class to attend or to recommend to your colleagues - ***Our single focus is to make YOUR training event or experience a success***. Here's why choosing Trivera Technologies as your security education resource takes the risk right out of your decision making process…

- **We provide a solid Java and OO development foundation**. Students will learn how to develop (and reuse!) essential Java and OO design skills and concepts properly, using best design practices, grounding them for advanced curriculum. Students will be prepared for designing and implementing real solutions, right after the class ends. Students will learn the importance of developing well-designed Java applications.
- **We're skills-centric.** Although our team has extensive experience using a variety of tools and solutions, our core content is "technology-centric". Our aim is to teach you the best skills and solutions out there – not to sell you software from any particular vendor.
- **Every training event is Unique and Important!** Our firm treats every delivery engagement like a first-run, important event, not simply a staffing assignment. For every class we deliver, the Trivera team works closely with yours to ensure that your course runs smoothly from start to finish, and that there are no surprises in the classroom for you, your students or the instructors. Our experts work with you to choose the right topics and courses that align with your true skills goals, tuning as needed. We align the best all-around trainer to fit your exact needs – not just whoever happens to be 'on the bench'. We offer pre-reading, quizzes and support resources to help assess and prepare your team for the training, so we can best tune the training and maximize their time in the classroom. We'll ensure that your classroom is set up and ready to go prior to course start. Throughout the course delivery, our instructors constantly evaluate the class delivery and students, tuning topics, activities, discussions and labs as needed to ensure all student skill levels and needs are targeted. All activities, data and results are documented and shared with your firm so you have a complete picture of the course and its results. Post training support is also included for your students to address any future related questions.
- **Our courses are focused, current and comprehensive - no "fluff" included.** We offer more than a "laundry list" approach to teaching. All lessons have clear objectives, are fundamental to core Java development and design practices, and are reinforced by extensive hands-on labs and solid practical examples. Each lesson has performance driven objectives that ensure students will learn technologies and skills core to fundamental Java application design – nothing more, nothing less. Our dedicated course development team keeps everything as current as possible with both industry trends and software editions to ensure your team is always getting the most current information available.
- **We take the pain out of classroom set up.** Hands-on courses also include our unique materials for each student, complete with our ***LoadNGo Instant Classroom*** course set up DVD, software, and a multitude of learning resources that complement the course. Run the course right off the DVD – minimal set up for your company – maximum results for your students. We'll work closely with you to

ensure your classroom is 100% ready to go at class start.

- **24 Hour Support Service** for students, instructors, facilities or anyone using our content or working with our instructors, in any way. There is someone here to assist you with questions, technical calls, set up, content – or whatever you need - at all times.
- **True content ownership gives us flexibility & quality above the rest.** Our course materials are **wholly-owned** by our company and fully customizable - at little or no cost- to help you best meet your learning objectives. As a courseware provider, our content and hands-on lab materials are licensed internationally by dozens of firms, and are therefore subject to very stringent quality requirements. Not only will your organization benefit from our own technical team's technical expertise, but also the feedback of hundreds of students and trainers using these materials, worldwide, on a regular basis. This unique fact guarantees that our materials are not only robust and interesting, but also technically correct, current and of the highest quality and usability.
- **We bring years of practical, current experience into the classroom and content.** Our dynamic instructors and course authors are also skilled Java, JEE, J2EE, .Net, SOA, and web services developers, architects and security-oriented professionals, currently active in their fields. This real-world experience translates directly to your classroom, and into our course materials.
- **Need GSA Schedule pricing, or a small-business status partner with whom to team?** Trivera Technologies is a 100% Female-Owned Small Business Concern, holding **GSA Schedule #GS-35F-0188T**. Please contact us for GSA rates, or team with us for your small-business or woman-owned set aside opportunities.
- ***Our services are guaranteed.*** Whether you're a stakeholder organizing your firm's educational services, a student in our live or virtual classroom or a trainer using our materials to educate your own client or team – **Our core mission is to make YOU a success in the classroom**.

For More Information

Need dedicated training? All courses can be brought onsite or produced virtually for a **private presentation**, customized to suit your unique requirements or goals. Please contact Training@triveratech.com for course details, Public Schedule dates and locations, and Special Discount Offers.

Need courseware or courseware development services? Let us take the risk out of your next curriculum development project or classroom delivery! All Trivera Technologies course materials are also available for corporate license with complete instructor support and free corporate branding. We guarantee our pricing and service. Samples of our course materials, as well as live client references for all of our services are available upon request. Please contact Courseware@triveratech.com for details.

For more information about our training, collaborative mentoring or courseware licensing options, our public course schedule, our training management services, or to see our complete list of course offerings, please visit us at **www.triveratech.com**, email Training@triveratech.com or call 609.953.1515.

TRIVERA TECHNOLOGIES | Collaborative IT Training, Mentoring & Courseware Solutions

TRAINING | MENTORING | COURSEWARE | CONSULTING | TRAINING MANAGEMENT SERVICES
ONSITE TRAINING | ONLINE TRAINING | DEDICATED TRAINING | PUBLIC SCHEDULE | COURSEWARE LICENSING & DEVELOPMENT

Some of TRIVERA TECHNOLOGIES COURSE OFFERINGS include:

Java | JEE | .Net | C# | ASP.Net | C++ | SQL | Python | Perl | C | COBOL
SOA | Web Services | Spring 3.0 | MVC | Hibernate | EJB | JSF | Struts | Ajax | Architecture | Design Patterns | Application Security | Database Security
OOAD | UML | Use Cases | Requirements | Groovy | Grails | Ruby | Estimation | Software Engineering | Software Design | Secure Software
Databases | JDBC | Oracle | DB2 | SQLServer | O/S | Windows | Linux | Unix | Administration | COBOL | Mainframe | Assembler | C++ | SQL
Test Driven Development | Testing | JUnit | NUnit | Agile | SCRUM | Selenium | CAST
IBM WebSphere | Rational / RAD | RSA | Cognos | FileNet | MQ Series | Business Objects | SAP | Oracle | WebLogic | JDeveloper | ADF | Eclipse | JBoss | TomCat | NetBeans
XML | XPath | Adobe | Flash | CSS | ExtJS | JavaScript | HTML5 | YUI | GlassFish | Crystal Reports
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