

# Java 8 Programming for Object Oriented (OO) Experienced Developers

## Java Programming Foundation Training Series

**Course:** TT2100-J8: Java Programming for Object Oriented (OO) Developers

**Duration:** 5 days

**Skill Level:** Introductory

**Focus:** Java 8 Applications (also offered for Java 7)

**Audience:** Programmers with prior hands-on experience programming in an Object-Oriented language, such as C#, C++, Smalltalk, etc.

**Hands-On Format:** This hands-on class is approximately 50/50 lab to lecture ratio, combining engaging lecture, demos, group activities and discussions with comprehensive machine-based practical programming labs and project work.

**Delivery Format:** We're flexible! This course is available for onsite private classroom presentation, or live online virtual presentation, or can be presented in a combined delivery learning solution. Please also visit our **Public Schedule** for open-enrollment course dates.

**Customizable:** This course may be easily tailored to target your specific training skills objectives, tools of choice and learning goals.

*Java 8 Programming for OO Experienced Developers* is a five-day, comprehensive hands-on introduction to Java training course geared for developers who have prior working knowledge of object-oriented programming languages such as C++. Throughout the course students learn the best practices for writing great object-oriented programs in Java 8, using sound development techniques, new improved features for better performance, and new capabilities for addressing rapid application development. In addition to the normal exercises that are liberally sprinkled throughout the course, there is a **case study** that 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 Objectives: What You'll Learn

Students who attend **Java 8 Programming for OO Developers** will leave this course armed with the required skills to develop solid object-oriented applications written in Java, using sound coding techniques and best coding practices. Geared for developers with prior OO development experience in languages such as C++ or SmallTalk, this course will teach students everything they need to become productive in essential Java programming.

Working within in an engaging, hands-on learning environment, guided by our expert Java practitioner, students will learn to:

- Understand not only the fundamentals of the Java language, but also its 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 multi-threading and exception handling features
- Understand and use classes, inheritance and polymorphism
- Understand and use collections, generics, autoboxing, and enumerations including new Java features and capabilities
- Work with the logging API and framework that is part of the Java platform
- Use the JDBC API for database access
- Use Java for networking and communication applications
- Work with annotations
- Understand and work with the classes in the concurrent package
- Outline the options for GUI applications in Java
- Take advantage of the Java tooling that is available with the programming environment being used in the class

Specific Java 8 features that are covered in the course include:

- The new Date API
- Lambda Expressions
- Streams
- Collectors

**Need different skills or topics?** If your team requires different topics or tools, additional skills or custom approach, this course may be easily adjusted to accommodate. We offer additional Java, JEE and Web programming courses which may be blended with this course for a track that best suits your development objectives.

**Hands- on Learning:** This course is about **50% hands-on lab and 50% lecture**, with extensive programming exercises designed to reinforce fundamental Java development skills and concepts learned in the lessons.

**Students will code numerous Java examples** to reinforce the major concepts covered in this course. The courses will increase in complexity as more sophisticated techniques are introduced. 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.

### ► Audience: Who Should Attend

This is an **introductory- 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 with OO languages such as C++ or C#.

**► Related Courses: Pre-Requisites & Learning Path**

**Take Before:** Students should have prior on the job, hands-on development experience programming in an object oriented language such as C#, C++.

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

- For those without prior OO experience: **TT2120-J8 Java 8 and OO Essentials for Developers New to OO (Such as C, COBOL, Mainframe or 4GL Developers)**
- For those who seek a Java for web development orientation: **TT5140-J8 Java 8 Web Essentials for OO Experienced Developers** which combines introductory Java topics with web essentials such as servlets, XML, etc..

**Take After:** We offer a variety of introductory through advanced Java, JEE and Java web development, programming, design and mobile development courses and learning tracks.

Some recommended follow-on courses include:

- Advanced Java, performance and tuning, Java design patterns
- Agile and Test Driven Development and JUnit training
- Java secure coding and application security training
- SOA and web services training
- web development and mobile development training
- JEE / Server-Side Java training
- Spring, Hibernate, Groovy Grails, JSF, Struts training and more

Please contact us for recommended next steps tailored to your longer term education, project, role or web development objectives.

**► Workshop Topics Covered****Session: Java - A First Look****Lesson: The Java Platform**

- Java Platforms
- Lifecycle of a Java Program
- Responsibilities of JVM
- Documentation and Code Reuse

**Lesson: Using the JDK**

- Setting Up Environment
- Locating Class Files
- Compiling Package Classes
- Source and Class Files
- Java Applications

**Session: Getting Started with Java****Lesson: Writing a Simple Class**

- Classes in Java
- Class Modifiers and Types
- Class Instance Variables
- Primitives vs. Object References
- Creating Objects

**Lesson: Adding Methods to the Class**

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

**Lesson: Language Statements**

- Operators
- Comparison and Logical Operators
- Looping
- Continue and Break Statements
- The switch Statement
- The for-each() Loop

**Lesson: Using Strings**

- Strings
- String Methods
- String Equality
- StringBuffer
- StringBuilder

**Lesson: Specializing in a Subclass**

- Extending a Class
- Casting
- The Object Class
- Default Constructor
- Implicit Constructor Chaining

**Session: Essential Java Programming****Lesson: Fields and Variables**

- Instance vs. Local Variables: Usage Differences
- Data Types
- Default Values
- Block Scoping Rules
- Final and Static Fields
- Static Methods

**Lesson: Using Arrays**

- Arrays
- Accessing the Array
- Multidimensional Arrays
- Copying Arrays
- Variable Arguments

**Lesson: Java Packages and Visibility**

- Class Location of Packages
- The Package Keyword
- Importing Classes
- Executing Programs
- Java Naming Conventions

**Session: Advanced Java Programming****Lesson: Inheritance and Polymorphism**

- Polymorphism: The Subclasses
- Upcasting vs. Downcasting
- Calling Superclass Methods From Subclass
- The final Keyword

**Lesson: Interfaces and Abstract Classes**

- Separating Capability from Implementation
- Abstract Classes
- Implementing an Interface
- Abstract Classes vs. Interfaces

**Lesson: Exceptions**

- Exception Architecture
- Handling Multiple Exceptions
- Automatic Closure of Resources
- Creating Your Own Exceptions
- Throwing Exceptions
- Checked vs. Unchecked Exceptions

**Session: Java Developer's Toolbox****Lesson: Utility Classes**

- Wrapper Classes
- The Number Class
- Random Numbers
- Autoboxing/Unboxing
- The Date Class

**Lesson: Enumerations and Static Imports**

- Enumeration Syntax
- When You Should Use Enumerations
- Using Static Imports
- When You Should Use Static Imports

**Lesson: The Date/Time API**

- The Date Class
- Introduce the new Date/Time API
- LocalDate, LocalDateTime, etc.
- Formatting Dates
- Working with time zones
- Manipulate date/time values

**Session: Collections and Generics**

- Lesson: Introduction to Generics
- Generics and Subtyping
- Bounded Wildcards
- Generic Methods
- Legacy Calls To Generics
- When Generics Should Be Used

**Lesson: Collections**

- Characterizing Collections
- Collection Interface Hierarchy
- Iterators
- The Set Interface
- The List Interface
- Queue Interface
- Map Interfaces
- Using the Right Collection
- Collections and Multithreading

**Session: Java Lambda Expressions and Streams****Lesson: Introduction to Lambda Expressions**

- Functional vs OO Programming
- Anonymous Inner-classes
- Lambda Expression Syntax
- Functional Interfaces
- Method references
- Constructor references

**Lesson: Streams**

- Processing Collections of data
- The Stream interface
- Reduction and Parallelism
- Filtering collection data
- Sorting Collection data
- Map collection data
- Find elements in Stream
- Numeric Streams
- Create infinite Streams
- Sources for using Streams

**Lesson: Collectors**

- Creating Collections from a Stream
- Group elements in the Stream
- Multi-level grouping of elements
- Partitioning Streams

**Session: Multithreading and Concurrency****Lesson: Multithreading**

- Principles of Multithreading
- Creating a Threaded Class
- Basic Features of the Thread Class
- Thread Scheduling
- Thread Synchronization

**Lesson: Concurrent Java**

- Concurrent Locks are Explicit and Flexible
- Executor Interfaces Provide Thread Management
- Challenges for Concurrent Use of Collections
- Concurrent Collections
- Atomic Variables Avoid Synchronization

**Session: Java I/O****Lesson: File System Access**

- The File Class

- File Utility Methods

**Lesson: Java I/O**

- The Java I/O Mechanism
- Subclasses Accessing Real Data
- Filter Classes
- New File IO - NIO
- NIO Overview

**Session: Java Application Development****Lesson: Introduction to Annotations**

- Annotations Overview
- Working with Java Annotations

**Lesson: Java Data Access JDBC API**

- Connecting to the Database
- Statement and PreparedStatement
- ResultSet
- Executing Inserts, Updates, and Deletes
- Controlling Transactions and Concurrency
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**Need courseware?** This course is fully customizable, and also available for license with complete support for qualified organizations. To learn more about our Courseware Services and Licensing options, please contact us at [Courseware@triveratech.com](mailto:Courseware@triveratech.com) for details.

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**► Student Materials: 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, detailed lab manuals and workbooks, code samples, software tutorials, diagrams and current reference materials, all directly related to the course at hand, indexed for ease of use. Step-by-step lab instructions, software tutorials and project descriptions are clearly illustrated and commented for maximum learning.

**► Setup Made Simple!**

Our mission is to ensure a smooth start to your course with minimum set up burden for your team or firm. We offer several course set up options to help meet that goal. Please inquire for details on requirements and costs.

- **Manual Course Setup.** Our team provides a detailed setup guide with specific instructions, packaged software and links for all course tools and labs, as well as much live assistance as required to prepare your attendees or classroom for the course.
- **Remote Lab Environment.** Your team can access our hosted environment to access and use the software, labs and tools required for the hands-on portion of the training.

- **Provide Pre-Loaded Equipment.** If needed, we can ship in pre-loaded equipment to your site.

#### ► **Focused, Skills-Driven Training | Maximizing Your Training Time and Value, while Reducing Risk**

Our training programs are designed to be skills-driven, focused events, targeted to deliver the true skills you need to succeed in your projects and role. We'll work with you to ensure that your valuable training time and dollar is truly maximized. If your team requires more or less advanced materials or additional or custom topics, this course may be easily adjusted to accommodate. We offer and can blend on a wide variety of surrounding and supporting tools and elements to build out a truly robust educational experience, for you, your team, or your entire organization.

Please contact us for details about our **Extended Education Programs** that support, surround, supplement or extend your

learning initiatives such as

- **Collaborative mentoring** for your team
- **Pre-and post-training assessments** help place learners on the right path
- Mentored, comprehensive **case-studies** can be woven into your training programs, complete with guided work and instructor interaction
- **Guided or self-paced projects**, homework and exams
- **Interactive, self-paced programs** students
- **Virtual lab hours** and/or constant Mentor access
- Role-basic, Topic-based or Goal-based corporate **Training Roadmap and Learning Paths development**, rollout and support
- Skills-focused custom **New Hire Training Programs** and team **Reskilling initiatives**
- **Learning Management or Vendor Management Services** for your organization.

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#### ► **Why Choose Trivera Technologies?**

Whether you're a manager choosing a training provider or course to bring to your team, an instructor looking for reliable, solid course materials, 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 **Java and JEE development training, mentoring and courseware resource** takes the risk right out of your decision making process...

- **Our 'skills-driven' courses are efficient, focused, current and comprehensive.** Our experts target exactly the skills your team needs to succeed in their jobs, projects or roles, rather than taking a 'laundry-list' approach to training, which can often result in overtraining, course overload or overwhelmed students. We'll work with you to define what it is you need to accomplish, and create the right program, training to those goals. Students of all skill levels will be able to hit the ground running with their new skills right after class ends, since the program was correctly designed from the start.
- **Our content is always updated and ready to go.** Our dedicated course development team keeps our training content, courses and student resources completely updated with the latest skills, industry trends and software editions to ensure your team is always getting the most current information, techniques and skills available.
- **Every training event is Unique and Important!** The Trivera team treats every delivery engagement like a first-run, important event, not simply a staffing assignment. For every class we deliver, our 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, throughout the course delivery, and afterwards. Post training support is also included for your students to address any future related questions.
- **We wholly-own our course content, giving Trivera flexibility & quality above the rest.** Our course materials are **owned** by our company and **fully customizable at little or no cost**. Dozens of training firms and independent instructors purchase and use our course materials, and hire us for training support as well. As a result, our courseware is subject to very stringent quality requirements. Not only will your organization benefit from our own technical team's technical expertise, but also from 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.
- **We're Java & JEE authors and industry speakers.** Our team was selected to write the online *JEE, EJB, EJB CMP-CMR and Web Services Tutorial Series for IBM developerWorks®*. These are the same instructors who train our classes and author the courseware. Most of our trainers/consultants have also authored additional articles on web services, EJB, Struts, JEE and advanced Java topics, and are recognized speakers and presenters on the industry technical seminar circuit. Our team is comprised on several successful published authors. Members

of our team have written or contributed to: *Eclipse Kick Start, Mastering Eclipse; Professional Jakarta Struts; Using Java Tools for Extreme Programming; Mastering Resin; Mastering TomCat and others.*

- **Need a small-business status with whom to team?** Trivera Technologies is a 100% Woman-Owned Small Business Concern. Please contact us to team with us for your small-business or woman-owned set aside opportunities.
- **Our prices and services are guaranteed.** We stand behind our courses and instructors 100%. We'll match or beat any pricing for similar services, any time. 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.**

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#### ► For More Information

**Need dedicated training?** All courses can be brought **onsite** or produced **online** / virtually for a private presentation, customized to suit your unique requirements or goals. Please contact us for course details and Special Discount Offers. Our pricing is always cost effective, and our services are guaranteed. Please also visit our **Public Training Schedule** for available open enrollment dates that may apply. Please contact [Training@triveratech.com](mailto:Training@triveratech.com) for more information, pricing and special offers.

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