

## TT3425: Integrating Spring 2.5 and Hibernate (Spring Emphasis) (5 days)

**Duration:** 5 days

**Focus:** Java application development integrating Hibernate and Spring 2.5

**Targeted Audience:** Experienced Java Developers

**Course Format:** Extensive hands-on programming labs; Expert lecture combined with open discussions and in-depth demonstrations

**Language / Tools:** Java 5 or Java 6 delivered with most IDEs: IBM Rational Application Developer (RAD); Oracle JDeveloper, Eclipse / Ganymede, Eclipse WTP, MyEclipse and more. Most application Spring 2.5 compliant servers including Tomcat, JBoss, WebSphere, etc.

**Delivery Format:** Available for onsite private classroom presentation, or live online / virtual presentation

**Customizable:** Yes



*Integrating Spring 2.5 & Hibernate (Spring Emphasis) is a four day in-depth Spring and Hibernate / J2EE training course geared for experienced Java developers who need to understand what Spring Framework is in terms of today's systems and architectures, and how to use Spring in conjunction with other technologies and frameworks. The course explores the Hibernate framework and how to apply Hibernate to persistence requirements in Java and J2EE applications. Students will also learn how to*

*integrate Hibernate as the persistence layer for Spring applications.*

### ► Course Overview

The Spring framework is an application framework that provides a lightweight container that supports the creation of simple-to-complex components in a non-invasive fashion. Spring's flexibility and transparency is congruent and supportive of incremental development and testing. The framework's structure supports the layering of functionality such as persistence, transactions, view-oriented frameworks, and enterprise systems and capabilities. Spring's Aspect-Oriented Programming (AOP) framework enables developers to declaratively apply common features and capabilities across data types in a transparent fashion.

Spring makes J2EE development easier. Spring simplifies common tasks and encourages good design based on programming to interfaces. Spring makes your application easier to configure and reduces the need for many J2EE design patterns. Spring puts the OO design back into your J2EE application, and it integrates nicely with JSF.

Hibernate is a powerful enabler that addresses object/relational persistence in the Java world. Hibernate offers all the advantages of developing in Java plus a comprehensive suite of capabilities for mapping object-oriented features to the relational model. This course tells you what you need to know to design and build your own Hibernate-enabled applications. You'll learn the details of the key Hibernate capabilities and how to leverage their strengths, with a special focus on using Hibernate with the Spring framework.

If you want to deliver an application using Hibernate within the Spring 2.5 framework, you'll find this course essential.

### ► Course Objectives: What You'll Learn

Students who attend **Integrating Spring 2.5 and Hibernate** will leave the course armed with the required skills to design and

implement Spring applications that effectively and transparently use Hibernate to manage data persistence. This course provides coverage of Hibernate concepts and practices for interacting between Java and relational databases. The areas addressed in this course range from data/class mapping and persisted object lifecycle and management to how Hibernate can be used in the Spring 2.5framework.

Working in a dynamic, lab-intensive hands-on coding environment students will learn to:

- Explain the issues associated with complex frameworks such as J2EE and how Spring addresses those issues
- Understand the relationships between Spring and J2EE, AOP, IOC, JDBC, Hibernate, JSF, Struts, JMS, and EJBs.
- Write applications that take advantage of the Spring container and the declarative nature of assembling simple components into applications.
- Work with Spring's support for transactions
- Explain how the issues associated with object persistence in a relational model are addressed by Hibernate
- Understand the relationships between SQL, Java, Spring, and Hibernate
- Write applications that take advantage of the Hibernate Persistence Manager.
- Map Java classes to relational tables.
- Capture both relational and inheritance associations in metadata using either XML or the Java 5 Annotations mechanism.
- Create and use mappings between Java classes and relational databases.
- Understand how identity and keys are handled in Hibernate.
- Understand the persistent object lifecycle and how that relates to transactions and concurrency.
- Understand how to use Hibernate within the Spring framework

The course provides a solid foundation in essential terminology and concepts, extended and built upon throughout the engagement. Processes and best practices are discussed and illustrated through both discussions and group activities.

Attending students will be led through a series of advanced topics comprised of integrated lectures, extensive hands-on lab exercises, group discussions and comprehensive demonstrations. Please see below for additional information about the hands-on lab work.

#### ► Audience & Pre-requisites: Who Should Attend

This is an **intermediate level** and beyond Java training course, designed for developers who need to understand how and when to use Hibernate in Spring applications. Attendees should have practical basic Java development experience equivalent to our TT2100 Core Java Fundamentals course.

#### ► Related Courses – Suggested Learning Path

**Take Before:** Students should have basic development skills and a working knowledge in the following topics, or attend these courses as a pre-requisite:

- **TT2100 Core Java Programming Fundamentals**

**Take Instead:** We offer other courses that blend Hibernate and/or Spring development skills with other pertinent topics:

- If some members of your team need to focus just on Hibernate, the **TT3200 Applying Hibernate to Persistence in Java** course may be more appropriate.
- If some members of your team need to focus just on Spring, the **TT3325 Mastering the Spring 2.5 Framework** course may be more appropriate.
- If your team needs more of a focus on Hibernate and less on Spring, please consider **TT3420 Integrating Hibernate and Spring 2.5 (Hibernate Emphasis)**
- If you need JSF with a basic overview of Spring & Hibernate: **TT6385: Integrating Core JavaServer Faces (with Spring 2.5 and Hibernate Overview)**
- Please note that all Spring training is also offered using Spring 1.x

Please note all development courses may also be offered in other programming languages or environments, as well as tailored to best suit your needs. Please contact us for details.

**Take After:** We offer a variety of introductory through advanced security, development, project management, engineering, architecture and design courses. Students may want to consider the following topics as a follow-on to this course.

- Additional advanced J2EE or JEE / Java EE topics: EJB3.0; Spring; Hibernate; Design Patterns & more.
- Java or J2EE Security topics
- Service-Oriented Analysis and Design
- Web Services – Intro through Advanced

- AJAX, XML or other Web Development topics
- Architecture & Analysis courses

Please note all development courses may also be offered in other programming languages or tailored to suit your unique requirements. Please contact us for recommended next steps tailored to your longer term education, project or development objectives.

#### ► Experiential Learning: Hands-On Labs

This class is “technology-centric”, designed to train attendees in essential Spring and Hibernate development skills, coupling the most current, programming techniques with the soundest industry practices.

This workshop is about **50% dynamic lab exercises** and **50% lecture**. 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. Multiple detailed lab exercises are laced throughout the course, designed to reinforce fundamental skills and concepts learned in the lessons. 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.

#### ► Delivery Environment: Tools to Use

Although this training is skills-centric, this course can be delivered using a variety of software combinations, including but not limited to: Eclipse / Ganymede, MyEclipse, Oracle JDeveloper or other IDEs. Application server options include Oracle WebLogic, Apache TomCat, JBoss and others.

Our detailed lab workbooks are complete with software-specific instructions, screen shots and step-by-step tutorials for using the software you select. In most cases we can easily port our classes to run in the environment of your choosing. Please inquire for details and options.

#### ► Easy & Secure Set Up! LoadNGo™ Instant Classroom Kit

For course deliveries or virtual presentation using open-source tools, we'll provide our unique **LoadNGo Instant Classroom Kit**, which enables students to run the entire course off of a DVD that hosts the entire course set up software, labs, and other pertinent useful educational resources, whitepapers and more. You only need to provide the hardware and appropriate O/S, and we'll do the rest. No installation needed. **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.

► **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, 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.

In addition to everything students need for the course, the **LoadNGo Instant Classroom Kit** described above also includes of workshop labs and solutions; non-restricted workshop software, APIs, documentation, technical education papers, and specifications and tutorials pertinent to the training course. Our course kits are designed to serve as an excellent and useful reference set, long after we leave your classroom.

► **Optional Pre / Post-Testing & Skills Assessment**

We work with you to ensure that your resources are well spent. Through our basic course pre-testing and/or post-course assessments, we ensure your team is up to the challenges that this course offers. Our goal is to structure the best solution to ensure your needs are met, whether we customize the material, or devise a different educational path to prepare for this course.

Please contact us for details about our online pre and post test assessment services, custom managed training plans for one student or your entire organization, or our custom online training program management system for monitoring the courses or progress while skilling your students of all experience levels.

► **Bridging the Gap: Collaborative Mentoring Services**

Our team of technical experts is also available for various project assistance services to help your team apply their newly-learned classroom skills to their real-world project in a meaningful, practical way, right after the training ends.

Our custom **collaborative mentoring programs** integrate with or extend your team's classroom training experience, to help bring these skills into existing (or inherited) legacy projects, into new projects, or to simply keep your students sharp them in between projects. Our programs 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.

---

**Workshop Topics Covered**

---

***Need more info?** 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](mailto: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](mailto:Courseware@triveratech.com) for details*

**Session: Introduction to the Spring 2.5 Framework**

- Inversion of Control
- Dependency Injection
- Spring Overview
- Spring Application Architectures
- Spring Container
  - Managing the Container
  - Access to Services and Resources
  - Application Contexts
- Beans as Components

- Beans and Factories
- XML Bean Configuration
- Bean Definition and Dependencies
- Bean Lifecycle
- Customization Options
  - Post-Processors
  - Property Editors

**Session: Data Access**

- Data Access Pattern
- Overview of Persistence Layer and Transactions
  - Transaction Overview
  - Spring Transactions
  - Defining Spring Transactions
  - Working with Demarcation
  - Managing Spring Transactions
- Spring JDBC
  - Spring JDBC Architecture
  - Working with JDBC Template
  - Database Operations
  - Handling JDBC Exceptions

**Session: Spring Views**

- Spring/Web Framework Architecture
- Spring MVC (optional)
  - Spring MVC Architecture
  - Spring MVC Components
  - Spring MVC Flow
  - Dispatcher and Controllers
  - Handlers and Mappings
  - Interceptors

**Session: Introduction to Hibernate**

- ORM Mapping Issues
- Hibernate Architecture
- Persistence, Identity, and Equality in Hibernate
- Domain Models and Metadata Options
- Options for Representing Persistence

**Session: Getting Started with Hibernate**

- Basic Mapping
  - Class/properties to Table/Columns
- Basic Configuration
- Mapping a POJO to a Database
- Syntax of mapping file

- Basics of Hibernate Session
- Working with Persisted Objects

#### Session: Basic ORM in Hibernate

- Configuring persistence
- Object Identity in Hibernate
- Generating Unique Keys
- Mapping Classes to Multiple Tables

#### Session: Value-Type Collections and Components

- Element Types
- Mapping Compositions
- Mapping Java Collections
- Bags and Dynamic Components

#### Session: Mapping Inheritance

- Strategies for Inheritance ORM
- Single, Class, and Concrete Table Patterns
- Discriminators

#### Session: Hibernate Annotations

- Working with Hibernate Annotations
- Annotation-Capable Sessions
- Annotations and Persistence
- Annotations, Mapping, and Relationships

#### Session: Working with Persistent Objects

- Transient, Persistent, and Detached
- Transitioning Between States
- Options for Retrieving Objects
- Attached and Detached States

- Update, Merge, and Cascade

#### Session: Querying for Objects

- Hibernate Query API
- Hibernate Query Language (HQL)
- HQL Syntax and Usage
- Criteria

#### Session: Spring and Hibernate

- Spring - Hibernate Support
- Session and Connection Management
- Hibernate DAOs
- Hibernate Template

### ► Why Work With Trivera Technologies?

- **We provide a solid J2EE / JEE and spring development foundation.** Students will learn how to develop (and reuse!) essential 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 enterprise Java applications.
- **Our courses are focused - no "fluff" included.** We offer more than a "laundry list" approach to teaching. All lessons have clear objectives, are fundamental to core Java, JEE or J2EE development and design practices, and are reinforced by hands-on labs and solid practical examples. Each lesson has performance driven objectives that ensure students will learn technologies and skills core to fundamental server-side application design – nothing more, nothing less.
- **Our materials are comprehensive, and current.** Our comprehensive manuals include not only a hard copy of the course presentation, but also detailed reference notes, pertinent diagrams and charts, current lists of suggested online resources and articles, and often technical tutorials or white papers geared to the topics at hand. Our dedicated course development team keeps everything as current as possible with both industry trends and software editions to ensure your team is getting the most current information available.
- **We set you 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 foster "Learning by Doing".** Progressive labs are designed in such a way that students get a firm grasp on fundamental skills while they work toward designing a complete application. All labs are take-home, and all solution code is presented in an easy to use self-study format for future use and review.
- **True content ownership gives us flexibility & quality above the rest.** These course materials are wholly-owned by our company and fully customizable - at little or no cost- to help you best meet your learning objectives. We have many dedicated experts available worldwide to instruct your team, and can provide services around the globe, either locally or virtually. We work closely with you to produce the most effective events and materials for your team, within your desired timeframe and budget.
- **We have to adhere to higher standards.** 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 instructors and course authors are also skilled mentors, Java, JEE/JavaEE, J2EE, .Net, Agile, SOA, and web services developers, architects and security-oriented professionals. We believe that learning, using and maintaining solid software execution and delivery methods are as important as gaining sharp coding skills. Best Practices for software development and execution, beyond technical coding skills, are enforced throughout all of our courses and discussions. Our team brings this extensive experience into every classroom and engagement.

- **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.
- **We're Java & JEE / J2EE authors and industry speakers.** Our team was selected to write the online *J2EE, EJB, EJB CMP-CMR and Web Services Tutorial Series for IBM developerWorks®* ([www.ibm.com](http://www.ibm.com)) 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, J2EE 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.*
- **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 Additional Information**

**Need dedicated training?** All courses can be brought onsite for a **private presentation**, customized to suit your unique requirements or goals. Please contact

[Training@triveratech.com](mailto:Training@triveratech.com) for course details, Public Schedule dates and locations, and Special Discount Offers.



*Trivera Technologies is a 100%  
Female-Owned Small Business Concern  
GSA Schedule # GS-35F-0188T  
Please contact us for details & pricing.*

**Need courseware?** Let us take the risk out of your classroom delivery! All 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](mailto:Courseware@triveratech.com) for details.

**For more information** about our training, mentoring or courseware licensing options, or to see our complete list of course offerings and services, please visit us at [www.triveratech.com](http://www.triveratech.com), email [Training@triveratech.com](mailto:Training@triveratech.com) or call 609.953.1515.