TT6520 Mastering JEE Design Patterns (5 days)

Geared for experienced enterprise Java (JEE) developers, ***Mastering JEE Design Patterns*** is a lab-intensive Java / JEE design patterns training course which explores the many sophisticated JEE-oriented design patterns and how to use these patterns to develop solid, robust and reusable JEE applications. Technologies such as JPA and EJB3, as well as frameworks such as Spring, web services, and rich interfaces, have significantly impacted previous generations of design patterns. Many of these technologies were heavily influenced by the very problems that previous design patterns addressed. While the basic patterns still ring true, the more advanced patterns have evolved into more robust solutions for secure, stable and scalable enterprise applications.

COURSE SNAPSHOT

Course: TT6520 Mastering JEE Design Patterns
Duration: 5 days (can be tailored)
Focus: JavaEE/ JEE applications
Targeted Audience: Experienced Java / JEE Developers; Architects & Designers
Skill-level: Intermediate
Hands-On Format: Approx 50/50 lab to lecture: 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 JEE compliant application servers including Apache Tomcat™, JBoss™, IBM WebSphere™, Oracle WebLogic™ and more.
Delivery Format: Available for onsite private classroom presentation, or live online / virtual presentation
Customizable: Yes – can be blended with other courses / topics, tailored to cover specific areas of interest, or tailored to include your organizations specific challenges / examples

Course Objectives: What You'll Learn

Working in a hands-on environment, developers will explore key patterns in each of the different JEE layers and how they used most effectively in building robust, reusable JEE applications. This course combines the use of hands-on coding labs with several "mini-projects" to be completed throughout the training to get the students using and reviewing the Patterns in a practical manner.

Students are led through an extended project whose solution includes the application of the various patterns as well as several cross-cutting patterns addressing issues such as security, transactions, and auditing.

Throughout the course we students will explore the following patterns, varying the levels of coverage to drill down on the most commonly used Patterns, and to simply survey others. Students will compare and contrast the patterns and explore the advantages and disadvantages of using certain patterns for explicit development functions in the JEE framework.

Course Overview: Hands-On Learning

This class is "technology-centric", designed to train attendees in essential JEE patterns background coupling the most current, effective techniques with the most effective practices.

Working in a dynamic, interactive discussion and hands-on programming environment, let by our JEE expert team, students will explore the following pattern categories:

- Crosscutting
- Presentation Tier
- Business Tier
- Integration Tier

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. 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.

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 JEE training course, geared for designers and architects that need to relate real problems to JEE-based solutions. Attendees should have practical experience developing basic JEE applications.

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:

- **TT4000 Understanding Internet Architectures**
- **TT2100 Core Java Programming Fundamentals**
- **TT5320 Developing JEE Component Compliant Applications** or **TT5100-JEE JEE Web Application Fundamentals**

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

- For the J2EE environment instead of JEE consider **TT6620 Architecting and Designing Service-Oriented JEE Applications**
- Essential Java (non JEE) patterns are covered in **TT1200-J Core Design Patterns & Java Frameworks**

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 follow-on options for this course:

- Java Security or JEE Security topics
- Java EE / JEE topics: EJB3.0; Spring; Hibernate; Design Patterns & more.
- Service-Oriented Analysis and Design
- Web Services – Intro through Advanced
- AJAX, XML or other Web Development topics
- Architecture & Analysis courses
- Software engineering or business analysis courses

Please note all development courses may also be offered in other programming languages or tailored to suit your unique requirements. We will work with you to come up with the best solution to ensure your needs are met, whether we customize the material, or devise a different educational path to help your team best prepare for this training. 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 JEE development skills, coupling the most current, effective 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 JEE compliant software combinations, including but not limited to: Eclipse / Ganymede, MyEclipse, IBM® WebSphere Rational Application Developer (RAD7), Oracle JDeveloper or other IDEs. Application server options include IBM WebSphere, Oracle WebLogic, Apache TomCat, JBoss and others. Please inquire for details and options.

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.

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 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.*

Session: Introduction to Design Patterns

- Overview of Patterns
- What is a Pattern?
- Why Patterns?
- Crucial Qualities of Good Patterns
- What are NOT Patterns?
- Classifying and Describing Patterns
- Overview of Patterns by Category
  - Gang of Four Patterns
  - Base Patterns
  - Presentation Tier Patterns
  - Business Tier Patterns
  - Integration Tier Patterns
  - Crosscutting Patterns

Session: Gang of Four Patterns

- Gang of Four
- Factory Pattern Family
  - Class Creation vs. Object Creation
  - Abstract Factory Pattern
    - Description
    - When to Apply
    - Structure
    - Example
    - Benefits and Liabilities
    - Issues
    - Lab
  - Simple Factory Pattern
    - Standard Pattern Description
  - Factory Method Pattern
    - Standard Pattern Description
  - Applying the Different Factory Patterns
  - Factory Patterns in Java/JEE Platforms
- Singleton Pattern
  - Standard Pattern Description
  - Impact of Threading on Singletons
  - Options for Addressing Threading Issues
  - Challenge of Double-Checked Locking in Java
  - Challenge of Clustered Servers
- Façade Pattern
  - Standard Pattern Description
- Iterator Pattern
  - Standard Pattern Description
  - Controlling Iteration
  - Robust Iterators
  - Aggregate Classes
  - Java Iterator Implementation

Session: Base Patterns

- Composite Pattern
  - Standard Pattern Description
  - Child Management
  - Composite Pattern in Java Platform
- Adaptor Pattern
  - Standard Pattern Description
  - Two-Way Adaptors
  - Adaptor Pattern in Java Platform
- Proxy Pattern
  - Standard Pattern Description
  - Types of Proxies
  - Proxy Pattern and Web Services
- Observer Pattern
  - Standard Pattern Description
  - Java Built-in Support of Observer Pattern
  - Observer Pattern in Java Platform
- Command Pattern
  - Standard Pattern Description
  - Command Pattern in Java Platform
- Gateway Pattern
  - Standard Pattern Description
  - Gateway, Façade, and Proxy
- Separated Interface Pattern
  - Standard Pattern Description
  - Controlling Dependencies
  - Plugin Pattern as Implementation
- Registry Pattern
  - Standard Pattern Description
  - Registry as Shared Object
- Special Case Pattern
  - Standard Pattern Description

Session: Applying Patterns

- Selecting the Right Pattern
- Adapting an Existing Pattern
- Creating a New Pattern
- Implementation Considerations
- Challenges in Working With Patterns
- Anti-Patterns

Session: Business Tier

- Impact of JEE on Business Tier Patterns
- Domain Model
  - Standard Pattern Description
- Dependency Injection
  - Standard Pattern Description
  - Dependency Injection in JEE
  - Service Locator vs. Dependency Injection
- Business Delegate
  - Standard Pattern Description
  - Business Delegate, JEE , and Web Services

Session: Integration Tier

- Data Transfer Object
  - Standard Pattern Description
- Data Access Object
  - Standard Pattern Description

- Java Persistence API (JPA)

Session: Presentation Tier

- Model View Controller
  - Standard Pattern Description
- Front Controller
  - Standard Pattern Description
- Application Controller
  - Standard Pattern Description
- Context Object
  - Standard Pattern Description
- Intercepting Filter
  - Standard Pattern Description
- View Helper
  - Standard Pattern Description
- Composite View
  - Standard Pattern Description
- Dispatcher View
  - Standard Pattern Description
- Service to Worker
  - Standard Pattern Description

Session: Crosscutting

- Security Enforcer
  - Standard Pattern Description
- Security Interceptor
  - Standard Pattern Description
- Audit Interceptor
  - Standard Pattern Description
- Doman Service Transaction
  - Standard Pattern Description

Session: Exploring Frameworks and Patterns

- Reuse and Productivity
- Spring Overview
  - Spring as a Lightweight Container
  - Dependency Injection Revisited
  - Setter Injection with Spring
  - Example
  - Configuration vs. Code
- Struts 2.0 Overview
  - Traditional MVC Pattern
  - Struts 2 Dependency Injection
  - Example
- JSF Overview
  - JSF Architecture Review
  - Patterns Used in the Architecture
  - Anti-Patterns in JSF
  - Examining Thread Safety in JSF Patterns

Appendix: EJB3 Overview

- Role of EJBs in JEE
- EJB3 Architecture
  - EJB3 Server and Container
  - Session Beans
  - Entities
  - Persistence Manager
  - Message-Driven Beans
  - Interceptors
  - Transaction Management
  - Deployment

Why Work With Trivera Technologies?

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 enterprise application education resource takes the risk right out of your decision making process…

- **We provide a solid enterprise Java / JEE application design and development foundation**. Students will learn how to develop (and reuse!) essential JEE development and 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.
- **We have to adhere to higher standards.** As a courseware provider to other organizations, training firms or independent instructors, 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. Our team has trained thousands of students.

- **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, online community contributors and industry speakers.** Our team was selected to write the online *J2EE, EJB, EJB CMP-CMR a*nd *Web Services Tutorial Series for IBM developerWorks®* (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 / 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; Python Programming; 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

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

Need dedicated training? All courses can be brought onsite or run virtually for a **private presentation**, anywhere around the world, 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? **Let us take the risk out of your classroom delivery!** All materials are also available on a worldwide basis for corporate license with complete instructor support and free corporate branding. Our LoadNGo Set up is available to partners as well! 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, mentoring or courseware development or licensing options, or to see our complete list of course offerings and services, please visit us at **www.triveratech.com**, email Training@triveratech.com or call 609.953.1515.