

## TT5320 Developing Applications for the JEE Platform (5 days)

Geared for experienced Java developers, *Developing Applications for the JEE Platform* is a comprehensive enterprise Java / JEE training course that provides students with the essential skills required build and deploy robust, scalable and secure business applications on the web using the JEE development platform, compliant with a variety of JEE API specifications from Sun Microsystems.

### COURSE SNAPSHOT

**Duration:** 5 days (can be tailored)

**Focus:** JavaEE/ JEE applications – JEE architecture and design

**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. Similar track to Sun's FJ-310-EE5.

**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

Students who attend *Developing Applications for the JEE Platform* will leave the course armed with the required skills to build and deploy robust, scalable and secure business applications on the web using the JEE development platform.

This course provides a thorough hands-on exploration of the key JEE APIs (EJB3, JPA, JMS, Servlets & JSPs, JSF, etc.) and how to leverage the strength of each technology to build web applications that are robust, efficient, and maintainable. Working in a hands-on environment, students will design and deploy a multi-tiered, e-commerce web based business application utilizing the core skills gained throughout this workshop. We'll also provide comprehensive coverage of critical JEE architecture and design issues, teaching students best not only practices, but also key mistakes to avoid.

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

The five-day course begins with a discussion of web application architecture. A major part of the course is spent on Servlets, JavaServer Pages (JSP), and JavaServer Faces (JSF). It then covers interacting databases, initially looking at JDBC, but then moving to JPA and how its implementations can handle mapping between objects and the relational model. Throughout the course, students will create code for an online store. Students will learn not only specific topics and APIs but also how to fit the pieces together into a complete application.

Topics covered include:

- JEE Application Architecture
- JDBC (Java Database Connectivity)
- JPA (Java Persistence API)
- Servlets
- Java Server Pages (JSP), EL, and JSTL
- EJB3
- JMS
- Web Services
- JEE Security

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

- Design and build robust, secure, and maintainable web applications
- Access databases with JDBC or JPA
- Create dynamic HTML content with Servlets and Java Server Pages, and JavaServer Faces
- Make Servlets, JSP/JSF work together cleanly
- Take maximum advantage of the EJB3 framework

The course provides a solid foundation in basic 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 / JEE training course, geared for experienced Java developers that need to relate real problems to JEE-based solutions. Attendees should have practical experience developing basic Java 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**

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

- For a more basic introduction to JEE consider **TT5120 J2EE Web Application Fundamentals with Servlets/JSPs, JDBC and More**

**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:

- **TT6520 Mastering JEE Design Patterns**
- **TT6620 Architecting and Designing Service-Oriented JEE Applications**
- 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.

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### Workshop Topics Covered

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**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: Overview of JEE

- Get a brief introduction of the JEE Framework.
- Understand the overall JEE Framework architecture.
- Understand what Technical Architecture challenges JEE is addressing and their technical solutions
- Overview of the complete architecture briefly touching all tiers and their associated JEE and JSE technologies.
- Get a complete technical overview of the JEE Platform
- Introduce how each tier is addressed in JEE
- Introduce the architectural role of each of the technologies
- Introduce the concept of the EAR and the deployment descriptors
- Introduce the relationship between JEE and Web Services
- List the different versions of JEE and

the related versions and APIs

#### Session: Introduction to JEE Web Applications

- Understand the concept of dynamic web applications
- Get an overview of the deployable unit of a web application
- Discuss how a web application is mapped to a URL using the context
- Understand the programming model of Servlets.
- Explain the request and response objects HttpServletRequest, HttpServletResponse.
- Be able to program a basic HTTP Servlet.
- Map URLs to a Servlet class
- Explain the life cycle of a JSP
- Explain the relationship between JSPs and Servlets
- Adding scripting to JSP using expressions, scriptlets, declarations
- Introduce two of the (nine) implicit objects
- Explain the JavaServer Faces (JSF) framework within the context of JEE web applications

#### Session: Developing architecturally correct JEE web applications

- Understand how patterns improve the quality of your code
- J2EE Business Tier Pattern: Model Façade and JPA
- J2EE Business Tier Pattern: Composite Entity

- J2EE Business Tier Pattern: Business Object
- Understand the challenge of database access in JEE applications
- Understand the challenge of mapping objects to the relational model
- Understand the concepts of a connection pool, JPA, and dependency injection
- Dispatching/forwarding to other pages.

#### Session: Web Application Programming Techniques with Servlet/JSP/JSF Development

- Introduce the ServletConfig and ServletContext objects
- Sharing data between Servlets using the ServletContext
- Client side session management using cookies
- Server side session management using HttpSession object
- List the implicit objects and their usage in scripting
- Forming a composite view using the jsp:include action
- Introduction on how to use custom tags and JSTL
- Using the errorData page context attribute
- Using JSF to provide consistent, manageable presentation tier

#### Session: Security in JEE Web Applications

- List the four main aspects of web

security

- List the three primary protocols for authentication
- Explain the configuration of security and the power of indirection
- Understand Users, Groups & Roles
- Understand role based security
- Understand principal mapping strategies
- Know when to apply Form Based Authentication
- Know how to configure your web-application in to use Basic authentication
- Give two reasons why basic authentication is used instead of form based authentication

### Session: Introduction to Enterprise JavaBeans 3

- Position JEE and Enterprise JavaBeans 3
- Explain the need for Enterprise JavaBeans 3
- Define purpose of Enterprise JavaBeans 3
- Understand the key features of the EJB3 Specification.
- List the primary components in an EJB3 server.
- List services the container may provide to the bean.
- Cover how annotations are used to ease EJB3 development
- Describe ways session, entity and message driven beans differ.
- Describe the purpose of the EJB jar file.

### Session: Writing a Session Bean

- Understand the life-cycle of a session bean
- Describe how annotations can be used to transform a POJO into a session bean
- Describe the difference between a stateful and a stateless session bean.
- Write a deployment descriptor for a session bean.
- Discuss pros and cons of using annotations rather than deployment descriptors
- Successfully deploy a session bean to a server.
- Show an example of how to implement a web service as a Stateless Session Bean
- Show how to write the web service endpoint

### Session: Using EJB from the Web tier

- Using dependency injection to locate resources.
- Understand the Business Delegate Pattern
- Understand the benefits of the Business Delegate pattern

### Session: Writing Entity Beans (Entities)

- List and explain the what JPA brings to the table.
- Describe what a JPA implementation is
- Explain the role of the Entity Manager
- Use annotations to transform a POJO

into an entity

- Work with entities

### Session: Messaging

- Understand what JMS is
- Understand the JMS API
- Understand the difference between Queues and Topics
- Name the two interfaces implemented by message-driven beans

### Session: Transactions

- Describe the need for transaction control.
- Explain isolation levels.
- Explain which isolation levels should be used
- List the three styles of transaction management.
- Explain how a bean would roll back a transaction.
- Explain the role of the Entity Manager in transactions.
- Understand the differences between container and application managed transactions

### Session: Security

- Define users, principals and roles.
- Describe what security information is placed in DD.
- Explain how container may provide security implementation.
- Understand how to bind roles to users/groups in an application server

## ► 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 advanced Java training and courseware resource takes the risk right out of your decision making process...

- **We provide a solid J2EE / JEE application 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 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 / 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.*
- **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 or run virtually for a **private presentation, anywhere around the world**, 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.



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