COURSE TABLE OF CONTENTS

Jakarta EE Developer

OEM: Open Source • Duration: 5 Days (35 hrs)

COURSE MODULES & TOPICS

Module 1: Jakarta EE Platform Overview

- Evolution from J2EE to Jakarta EE
- Jakarta EE 11 profiles and new features
- Namespace change: javax.* to jakarta.*
- Containers, tiers, and packaging formats
- Application server comparison: Payara, WebLogic, WildFly, Open Liberty
- Lab: Build and deploy a WAR to Payara 7

Module 2: Web Tier: Servlets, Pages, and Faces

- Servlet 6.1 lifecycle and asynchronous processing
- Requests, responses, filters, listeners, sessions
- Jakarta Server Pages, Expression Language, Tag Library
- Jakarta Faces: component model and Facelets templating
- Navigation, conversion, and validation in Faces
- Lab: Product catalogue web interface with filter and Faces form

Module 3: Contexts and Dependency Injection (CDI)

- Beans and bean discovery
- Scopes: request, session, application, conversation
- Injection points, qualifiers, alternatives
- Producers and disposers
- Interceptors, decorators, events, observers
- Lab: Logging interceptor and order-placed event

Module 4: Jakarta Persistence and Data

- Entities, mapping, primary keys, Java records as embeddables
- Relationships, inheritance, fetch strategies, N+1 query problem
- JPQL, Criteria API, named queries
- Entity manager, persistence context, optimistic locking
- Jakarta Data repositories in Jakarta EE 11
- Database access and DataSource configuration
- Lab: Map schema, write queries, add repository interface

Module 5: REST APIs and JSON Processing

- Jakarta REST: resources, HTTP methods, parameters, content negotiation
- JSON-B and JSON-P for serialization and processing
- Exception mappers, filters, REST client API
- API design: status codes, error payloads, pagination, versioning
- Lab: Expose and consume REST resources

Module 6: Transactions and Enterprise Beans

- Jakarta Transactions: container-managed and bean-managed
- @Transactional, propagation, rollback rules
- Enterprise Beans: stateless, stateful, singleton, timers
- Choosing between EJB and CDI beans
- Lab: Funds-transfer order operation and rollback

Module 7: Messaging and Concurrency

- Jakarta Messaging: queues, topics, producers, consumers
- Message-driven beans
- Jakarta Concurrency: managed executors, scheduled tasks, context propagation
- Virtual threads on Java 21
- Jakarta WebSocket overview
- Lab: Asynchronous order confirmations via queue

Module 8: Security and Validation

- Jakarta Security: authentication mechanisms, identity stores
- Role-based authorisation and programmatic security
- Securing REST endpoints
- Jakarta Validation: constraint annotations, custom constraints
- Validation in REST and persistence
- Common web vulnerabilities (OWASP Top 10)
- Lab: Secure catalogue with database identity store and roles

Module 9: Deployment and Server Administration

- Payara: asadmin, admin console, domain structure, JDBC pools, logs
- WebLogic: console, domains, JDBC data sources, WLST scripting
- Deploying applications to Payara and WebLogic
- Troubleshooting: class loading, port conflicts, authentication errors
- Lab: Create data sources, deploy application, run WLST script

Module 10: Testing and Migration to Jakarta EE

- Unit testing with JUnit 5
- Integration testing with Arquillian or Testcontainers
- Migration strategies: javax.* to jakarta.*
- Tooling: Eclipse Transformer, OpenRewrite, library compatibility
- Changes and removals in Jakarta EE 11
- Lab: Migrate Java EE 7 sample and redeploy

Module 11: Capstone Project

- Extend application with order workflow
- Combine REST, persistence, security, messaging
- Instructor code review and design discussion
- Lab: Demonstrate and review working application