# Java EE 7: Back-End Server Application Development

## Course Outline

### Java Platform, Enterprise Edition

- The Java EE Platform
- Java EE specifications
- The needs of enterprise application developers
- A comparison of services and libraries
- Java EE application tiers and architecture

### Enterprise Development Tools and Applications

- The development process of Java EE applications
- The purpose of an application server
- Properties of Java EE components
- Configuring and deploying Java EE applications

### Java Beans, Annotations and Logging

- Using common Java annotations
- Java SE features in Java EE applications
- Creating POJO JavaBeans components
- Using logging
- The role of annotations in Java EE applications
- Developing custom annotations

### XML Programming with JAXB

- The benefits of XML
- Reading and writing XML documents with JAXB
- xjc: the JAXB binding compiler
- The Java XML Binding API (JAXB)
- JAXB annotations
- Java XML APIs
- XML namespaces and schemas

### SOAP Web Services with JAX-WS

- Creating JAX-WS web service clients
- Comparing WSDL-first and code-first design approaches
- Generating WSDL from a Java class
- Writing a JAX-WS web service
- Overview of WSDL files
- Overview of SOAP

### Java Naming and Directory (JNDI) Services

- JNDI packages
- Directory service concepts
- Using JNDI to look up JDBC and EJB components in Java EE
- What is JNDI?
- Naming service concepts

## The EJB Component Model

- Session bean packaging and deploying
- Local, distributed and no-client EJB client access views
- The role EJB components play in Java EE appplications
- EJB Session types
- The role of the EJB container
- Stateless, Stateful and Singleton EJBs
- EJB changes in Java EE 7

## Contexts and Dependency Injection

- Using Qualifiers
- Using Interceptors
- Using Producers and Disposers
- What is dependency injection?
- Using Events and Stereotypes
- The beans.xml file and Alternatives

## Java Message Service

- Queues and topics
- Publish/subscribe messaging architecture
- Message producers and consumers
- JMS Overview
- Why do we need JMS?
- Point-to-point messaging architecture
- Durable vs. non-durable subscriptions
- What is the Java Message Service?

## Message-driven Beans

- Creating a message-driven bean
- Creating life cycle handlers for message-driven beans
- Configuring a message-driven bean
- The life cycle of a message-driven bean

## Java EE Concurrency

- Asynchronous EJBs
- Concurrency in Java EE
- Managed Executors

## JDBC in Java EE Environments

- Overview of the JDBC API
- The Data Access Object pattern
- Using CDI to inject a JDBC resource in a Java EE component

## Transactions in Java EE Environments

- What are transaction semantics?
- Comparing programmatic and declarative transaction scoping
- Using JTA to scope transactions programmatically
- Controlling container-managed transaction propagation
- Implementing a container-managed transaction policy using declarations

## Java Persistence API

- Persistence contexts and persistence units
- Create, read, update and delete operations with JPA
- Entities and the entity manager
- Object-relational mapping
- Create typed queries in JPA with JPQL

## Bean Validation with JPA

- Using the built-in validation constraints
- JPA lifecycle phases where validation takes place
- Using validation groups
- Programmatic validation by injecting a Validator
- Creating a custom bean validation constraint
- What is Bean Validation?

## Timer and Batch Services

- Jobs, steps and chunks
- Programmatic and automatic timers
- What are timer services?
- Batch examples
- What is Batch processing?

## Security

- Authentication, authorization and confidentiality
- Creating users and groups and mapping them to roles
- Defining possible web service attack vectors
- Apply Java EE security using deployment descriptors