# Course Design and Outline

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| Learning Program | Duration |
| --- | --- |
| **Rest Services (JAX-RS)** | 3 Days |

## Pre-Reading Material

1. XML : <http://www.itechcollege.com/courses/XML/>
2. XML Schema: <http://www.w3schools.com/xml/xml_schema.asp>
3. Web Services : <http://docs.oracle.com/javaee/6/tutorial/doc/gijti.html>
4. Web Services: <http://www.java2blog.com/2013/03/web-service-tutorial.html>
5. SOAP : <http://www.w3schools.com/xml/xml_soap.asp>

**Note: use CTRL+Mouse click to open theses links or paste them to the browser address bar**

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# Learning program overview

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| Course name and description | * **Java Web Services** * This training is designed only for those participants who have previous experience in Java/Jee development and want to build, host Web Services and Web Services Clients on Java Platform |
| Course learning objectives | * Develop, deploy, and monitor SOAP and RESTful web services and web service clients with JAX-WS and JAX-RS * Implement a Service-Oriented Architecture (SOA) using web services * Create and deploy WSDL-first and code-first SOAP web services * Build secure SOAP and REST clients * Unit Test Web services with Soap UI |
| Effectiveness measure | * Assessments are built for all programs, team members mandatorily need to complete both pre and post assessments, else participation will be considered as void |

# Program outline

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| --- | --- | --- |
| **Program Name** | **Rest Services (JAX-RS)** | **Est. time** |
| **Instructional Strategy** | * In this course, we would first introduce the concept, followed by hands on activity in each of the lesson to ensure learners are able to apply the concept into the systems or application. * At the end of every learning objective we will present some quiz questions to participants. * The Assessment which is Post would be directly linked to the Learning Objectives of the program stated above. | |
| **Lesson** | **Topics** |  |
| **Introduction to Web Services** | * Designing an SOA integration architecture * Implementing SOAs with web services * Building SOAP-based services with JAX-WS * Developing RESTful services with JAX-RS | 1.5 hour |
| **SOAP & WSDL** | * Messaging Model * The SOAP Envelope * Web Services as Component-Based Software * Message Description * Messaging Styles * The Concrete Model - Ports, Services, Locations * Extending WSDL – Bindings. * Service Description | 30 min |
| **Implementing Code-First Web Services** | * Applying JAX-WS annotations to POJOs * Configuring and deploying a web service implementation * Generating client-side artefacts from WSDL * Modifying client code to permit message monitoring * Incorporating best practices for web services * Implementing policies for security, reliability and mes-sage optimization | 1 hour |
| **JAXB** | * The Need for Data Binding * Mapping Schema Types to Java * Java-to-XML Mapping Using Annotations * Marshaling and Unmarshaling | 2 hours |
| **JAX-WS** | * POJO Based Web Services * The @Web Service Annotation * Generated Code * More JAXB: Mapping Collections * More JAXB: Mapping Enumerations * The @Web Method, @XmlParam, and Related Annotations * Scope of Code Generation * More JAXB: Mapping Inheritance * Controlling the XML Model * Controlling the WSDL Description * Hands on session | 3 hours |
| **Generating Contract-First Web Services** | * Comparing contract-first and code-first services * Creating portable Java artefacts * Building interoperable applications by conforming to Web Services Interoperability (WS-I) standards * Implementing a web service endpoint using JAX-WS | 3 hours |
| **Restful Web Services with JERSY (JAX-RS)** | * Introduction to REST   + REST and the Rebirth of HTTP   + RESTful Architectural Principles * Designing RESTful Services   + The Object Model   + Model the URIs   + Defining the Data Format   + Assigning HTTP Methods * Your First JAX-RS Service   + Developing a JAX-RS RESTful Service   + Deploying Our Service   + Hands on session * HTTP Method and URI Matching   + Binding HTTP Methods   + @Path   + Subresource Locators * JAX-RS Injection   + The Basics   + @PathParam   + @MatrixParam   + @QueryParam   + @FormParam   + @HeaderParam   + @CookieParam   + Common Functionality   + Hands on session   + Hands on session * JAX-RS Implementations (Discussion)   + Jersey   + Apache CXF   + JBossRESTEasy | 4 hours |
| **Developing RESTful Clients** | * Building the client's request * Handling the service's response code and excep-tions * Mapping XML with Java API for XML Binding (JAXB) * Converting Java arguments with JAXB and JAX-RS * Processing asynchronous messages * Implementing server-push with JAX-RS * Delivering asynchronous client requests | 2 hours |
| **Providing Server-Side Support for Ajax Clients** | * Applying cases for JSON with RESTful services * Interpreting a message formatted as JSON * Controlling JSON generation with JAXB annotations * Defining a JSON return type from a Java method | 2 hours |
| **Securing Web Services** | * Configuring HTTP Basic Authentication * Establishing secure message transmission with SSL/TLS * Controlling access to web services and methods * Providing authentication information to web services | 3 hours |