

## Developing Java Web Services Course Content

### 1. Interoperable Web Services

- Describe the motivation for developing and using web services in business software
- Describe the characteristics of a web service
- List and describe the standards on which web service architecture is founded
- List and describe the primary web service initiatives, specifications, and application programming interfaces (APIs)
- Describe the Web Services Interoperability Organization (WS-I) Basic Profile and its importance to the web services community

### 2. Java Web Services Technologies and Platforms

- Describe the support, APIs, and benefits provided by the Java programming language for creating web services
- Describe the service support, architectural options, endpoint models, and benefits provided by the J2EE platform for creating web services
- Create, deploy, and test a web service on the J2EE platform

### 3. Extensible Markup Language (XML) Overview

- Define XML
- Describe XML syntax and its purpose
- Describe the significance of XML namespaces
- Describe the Document Type Definition (DTD) and its use in an XML document
- Describe the significance of XML namespaces
- Define the structure and purpose of an XML schema

### 4. XML Processing APIs

- Define the need for processing XML documents
- Describe the XML system architecture
- Describe Simple API for XML (SAX)
- Describe Document Object Model (DOM)
- Describe Java API for XML Processing (JAXP)
- Describe Java API for XML Binding (JAXB)
- Describe Extensible Stylesheets Language Transformations (XSLT)

## 5. Simple Object Access Protocol (SOAP)

- Describe the function of SOAP in the web services architecture
- Describe the structure of a SOAP message and the function of each primary SOAP element
- Describe the characteristics of the Internet transport protocols commonly used to transmit a SOAP message
- Describe the information models available when creating SOAP-based web services
- Describe the techniques for encoding information within the body of a SOAP message
- Describe the function of the SOAP with Attachments specification
- List the pros and cons of using SOAP as a message format and describe an alternative architecture for transmitting XML-based information between applications

## 6. SOAP With Attachments API for Java (SAAJ)

- Describe the function of the classes, interfaces, and methods contained in SAAJ
- Describe the relationship between SAAJ and DOM and the impact this has on a web service developer
- Create and manipulate a SOAP message using the classes, interfaces, and methods contained in SAAJ
- Create and manipulate a SOAP message with attachments using the classes, interfaces, and methods contained in SAAJ
- Describe how to manage namespaces included in a SOAP message using SAAJ

## 7. Web Services Description Language (WSDL)

- Describe the role that an interface description language (IDL) plays in a distributed computing environment
- Describe the role that WSDL plays in the web service model and the primary elements contained in a WSDL file
- Describe the role of extensibility elements used in a WSDL file
- Compare the use of WSDL in document-style and remote procedure call (RPC)-style services

## 8. The Service Registry

- Describe the purpose of a service registry
- Define the two types of service registries
- Describe the purpose of eXtensible Markup Language (eXML)
- Describe the purpose of Universal Description, Discovery, and Integration (UDDI)
- Describe the data structures defined in UDDI
- Describe the API exposed to the client by UDDI implementations
- Describe the purpose of the Java API for XML Registries (JAXR)
- Use the JAXR API to access a UDDI registry

## 9. Java API for XML-based RPC (JAX-RPC)

- Describe the functionality provided by JAX-RPC for creating web services
- Describe how you can create web services or service clients using the wscompile tool
- Use the Java-to-WSDL development approach to create a web service
- Use the WSDL-to-Java development approach to create a web service and a web service client
- Compare the two development approaches supported by JAX-RPC for creating web services and service clients

## 10. JAX-RPC Advanced Concepts

- Describe how JAX-RPC supports SOAP messages that include attachments
- Use JAX-RPC to create a message handler that processes the contents of a SOAP message header
- Describe how JAX-RPC supports J2EE components as web services
- Describe the session support mechanism provided by JAX-RPC
- Describe the types of web service clients that you can use with JAX-RPC and the criteria that you should use to determine the type of client most appropriate for accessing a given service

## 11. Security

- Describe some of the security issues relating to web services and the basic techniques that you can use to address some of these issues
- Describe the function of public- and private-key encryption and digital signatures when implementing a security solution for an enterprise application
- Describe the common techniques used to implement a security solution for Java technology and J2EE platform web services

## 12. Design and Quality Guidelines

- Describe the use of J2EE design patterns in web services architecture
- Apply J2EE design patterns in practical cases
- Describe Quality of Service (QoS) issues specific to web services
- Describe exceptions generation and handling in web service interactions