

# Application Development with XML, Web Services and Java

### **Course Outline**

Suitable for people with some knowledge of programming and XML, this course starts with the basics of XML. Students will learn the Java API for XML, different types of Parsers to parse XML document. Finally the protocols and technologies underpinning Web Services will be introduced, and students will explore how they can be used to develop distributed software applications.

### **XML and Java**

- Review of XML Syntax, DTD and XML Schema; the Document Object Model (DOM)
- Overview of Java APIs: JAXP, JAXB, JDOM, JAXM, JAX-RPC and JAXR
- Java API for XML Processing (JAXP)
- Understanding the Simple XML API (SAX)

### **XML Parsers**

- Basics of XML Parsers
- SAX Parsers and DOM Parsers
- Reading XML documents
- Error and content handling
- Comparing SAX and DOM parsers
- Accessing Elements and Attributes in XML Document

### **Web Services: A component-oriented approach**

- Overview of Web Services; technologies, protocols and architectures
- Why have Web Services: Web services vs traditional approaches to designing distributed applications; component-oriented approach vs object-oriented approach
- Review of XML; XML Schemas; the role of XML-based standards in Web Services
- Building blocks: XML plus HTTP plus SOAP plus WSDL plus UDDI

### **Web Service Architectures**

- Web Services architectures and Service Oriented Architectures
- The Web Services Programming Model (API)

### **Implementing an XML Web Service:**

- Using XML and Web Services with Java
- Implementing and Deploying XML Web Service
- Managing State of XML Web Service with WSDD
- Exception handling with XML Web Services

### **Prior Knowledge Required**

Successful completion of "Introduction to Java programming" or knowledge of topics therein. Knowledge of XML fundamentals, as taught in "Introduction to XML and XSL"

### **Software Version**

Java JDK 1.4.1 on Unix (Solaris and/or Linux) platform

For a description of what study at this level involves see the Accredited Courses section in the Courses for Adults prospectus

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# Courses for Adults

## Application Development with XML, Web Services and Java

### Recommended Reading

The tutor will suggest possible material during class.

### Tutor Information

Kosmas - Othon Kosmopoulos has taught in a number of British and American institutions in both undergraduate and postgraduate level as well as in adult further education courses. Most notable are Huron University, Middlesex University and the University of Westminster. He is a specialist in the computer networks field but also has long experience in teaching a broad range of computing related courses from Business information systems to Web development.

### Learning Outcomes

On completion students will:

- Have a detailed knowledge of key standards and APIs relevant to the programming of XML using Java
- Be able to manipulate XML objects in Java
- Be able to parsing programs in Java using XML APIs
- Be able to explain the roles and interaction of the key technologies, protocols and architectures which constitute Web Services
- Be able to apply a component-based approach (i.e. Web Services) in software development for distributed systems
- Be able to appreciate the importance of non-proprietary standards (especially XML) in software development

### Assessment Criteria

Students will have:

- Demonstrated knowledge of key standards and APIs relevant to the programming of XML using Java
- Demonstrated basic knowledge of XML parsers and their effectiveness
- Written programs, which access elements and attributes in an XML document
- Demonstrated knowledge of the role of Web Services
- Implemented a Web Services consumer using Java
- Located a Web Service using UDDI
- Published and deployed a Web Service
- Wrapped existing modules into Web Services.

### Assessment Method

Students will:

- undertake short programming exercises
- demonstrate working programs

### Evidence of Achievement

- the student will save exercises and programs in electronic form
- the tutor will keep a record of student progress

### Credit Value

10 CATS Credits, Level 2

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