

XML Programming Using C# and .NET (4 Days) CTI 414

This course builds skills in .NET's XML processing APIs – chiefly parsing using XmlReader and the Document Object Model (DOM), writing XML streams using XmlWriter, and transformations using XPath and XSLT, all using the .NET Framework XML classes and the C# language. It also covers XML serialization according to XML Schema and the tight coupling between XML and ADO.NET.

Prerequisites: Ability to read and write well-formed XML. Ability to read a DTD not required but preferred. A working knowledge of programming the .NET Framework using C#. A working knowledge of ADO.NET is recommended.
Minimum software requirements: Microsoft Windows XP with Service Pack 2, Visual Studio.NET 2005.
Minimum hardware requirements for all machines: Pentium PC running at 500 MHz; 256 Mb RAM; 4 GB free hard disk space before installation; Internet access.
Microsoft PowerPoint and Internet access on instructor's workstation for presentation purposes.

Module 1: .NET Framework

XML Overview

- XML in the .NET Framework
- .NET XML Namespaces and Classes
- How the MSXML Fits in .NET
- .NET XmlReader and XmlWriter
- .NET DOM Parser
- XML Serialization
- XML and ADO.NET
- XPath and XSLT
- XML and the Web

Module 2: Reading XML Streams in .NET

- XML Document Streams
- The XmlTextReader Class
- Accessing Node Properties with the .NET XML Classes
- Accessing Attribute Values
- Traversing the XML Document
- Catching XMLExceptions
- The XmlNodeReader Class
- Using XmlReader with .NET 2.0

Module 3: Validating XML Streams

- Specifying Valid Documents with XML Schema and DTD
- Using Visual Studio 2005 to Create Schemas
- Validating XML with XmlReader

Module 4: Writing XML Streams in .NET

- The XmlWriter Class
- WriteXXX Methods
- XmlWriter States
- Writing Elements
- Writing Attributes
- Writing Namespaces
- Using XmlWriter with .NET 2.0

Module 5: The Document Object Model in .NET

- Origins of the DOM
- DOM Levels
- DOM2 Structure
- The XmlDocument Class
- DOM Tree Model
- DOM Interfaces
- XmlDocument, XmlNode and XmlNodeList Classes
- XmlElement and XmlText Classes
- Finding Elements by Name
- Walking the Child List
- The XmlAttribute Class

Module 6: Manipulating XML Information with the DOM

- Creating and Modifying Documents
- Modifying Elements
- Error Handling
- Managing Children
- Cloning
- Splitting Text and Normalizing
- Modifying Attributes

Module 7: Using XML Schema

- What is an XML Schema?
- Schema vs. DTDs
- Structure of a Schema
- Schema vs. Instance Document
- Associating Schemas with Documents
- Visual Studio 2005 Graphical Schema Editor
- .NET Schema Object Model

Module 8: XML Serialization

- XmlSerializer
- What is Not Serialized
- Writing and Reading XML
- Customizing XML Serialization
- XML Schema and XSD
- Creating Classes from Schemas
- XML Serialization and Web Services

Module 9: XML and ADO.NET

- Strong Coupling Between ADO.NET and XML
- Rendering XML from a DataSet
- Controlling XML Output
- Reading XML into a DataSet
- XML Schema and DataSets
- Typed DataSets
- Synchronizing DataSets and XML

Module 10: XPath

- Addressing XML Content
- XPath in XSLT
- Tree Structure
- XPath Expressions
- Context
- Axis, Node Test, and Predicate
- Abbreviations
- XPath Functions
- XPath and .NET
- XPathNavigator
- Editing with XPathNavigator in .NET 2.0

Module 11: Introduction to XSLT

- XSL and XSLT
- Rule-Based Transformations
- Templates
- Producing Text, HTML, and XML
- XslCompiledTransform

Module 12: XML Performance Tradeoffs

- DOM vs. XmlReader/XmlWriter
- Validating vs. Non-Validating Parser
- XPathDocument vs. XmlDocument in XSLT
- Benchmarking XML Performance

Appendix A: Zenith Courseware Case Study

- Appendix B: Learning Resources