

**Course 2663 — Instructor-led**

**Course Length: 3 days**

**At the end of this course, students will be able to:**

- Explain how XML is integrated into the .NET Framework and the classes associated with XML in the .NET Framework.
- Parse and read XML in the .NET Framework.
- Write and validate an XML document.
- Manipulate cached XML documents in memory.
- Query XML documents.
- Transform XML documents.
- Create new XML schemas programmatically.

**Prerequisites:**

**Before attending this class, students must have:**

- Experience with programming languages such as Visual Basic .NET or Microsoft Visual C#.
- Experience using the Microsoft Visual Studio .NET developer environment.
- Experience building applications using the Extensible Stylesheet Language for Transformation (XSLT), XML Path Language (XPath), and XML schemas.

**Course Outline**

**Module 1: Introduction to XML in the .NET Framework**

This module introduces the use of XML in the .NET Framework to help you solve common business problems. XML is a standards-driven technology that is ideal for applications that use the Internet. Microsoft's implementation of World Wide Web Consortium (W3C) standards ensures that applications you develop with XML in .NET will successfully communicate with other W3C-compatible applications

*Lessons*

- Overview
- Course at a Glance
- Common Business Problems
- XML in the .NET Framework

**Module 2: Parsing XML**

This module discusses how to parse XML data from a file, string, or stream by using the `XmlReader` class. It also covers how to use the `XmlTextReader` to process XML as text, and how to use the `XmlNodeReader` to filter data by using an XPath expression and the object.

*Lessons*

- Overview of XML Parsing
- Parsing XML Using `XmlTextReader`
- Creating a Custom Reader

*Lab 2.1: Parsing XML*

- Exercise 1: Building an XML Web Service to Parse XML

**Module 3: Validating XML**

This module gives an overview of XML Schema Definition (XSD) data types, and then covers how to use the Microsoft .NET Framework XML classes to perform XML schema validation. The lesson Advanced Validation teaches how to resolve external entities, how to validate XML fragments, and how to validate XML by using a Document Type Definition (DTD).

*Lessons*

- Examining Schemas
- Validating XML While Parsing
- Advanced Validation

*Lab 3.1: Validating XML*

- Exercise 1: Extend an XML Web Service to Validate XML

**Module 4: Writing XML**

Writing XML is a central skill in developing XML-based applications. This module describes the .NET Framework classes that are used to write XML with or without namespaces. The module also explains how to control the format and validity of XML as it is being written.

*Lessons*

- Overview of Generating XML Documents
- Writing XML
- Generating XML with Namespaces
- Controlling XML Format and Converting XML

*Lab 4.1: Writing XML*

- Exercise 1: Building an XML Web Service to Write XML

# Programming with XML in the Microsoft .NET Framework

## Course 2663 — continued

### Module 5: Querying XML

This module explains the process of querying an XML document by using XPath. It explains how to write code to load an XML document, and how to create a navigation cursor by using an XPathNavigator object. It also explains how to create your query by using an XPathDocument object, and how to examine the result types. In addition, this module describes how to compile your query and evaluate your results.

#### Lessons

- Introduction to Querying XML Using XPath
- Creating and Navigating a Document Cache
- Executing Your Query

#### Lab 5.1: Querying XML Documents Using XPath

- Exercise 1: Creating and Loading an XML Data Cache
- Exercise 2: Compiling and Executing Queries That Return Nodes
- Exercise 3: Compiling and Executing Queries That Return Numbers
- Exercise 4: Compiling and Executing Queries That Return Strings

### Module 6: Manipulating Cached XML

This module introduces the XML Document Object Model (XML DOM) and explains how to locate and manipulate XML by using the DOM.

#### Lessons

- Introduction to the XML Document Object Model
- Navigating XML Using the DOM
- Creating New Nodes
- Modifying and Deleting Nodes

#### Lab 6.1: Manipulating Cached XMLDocument Objects

- Exercise 1: Loading an XML Document
- Exercise 2: Navigating an XML Document

- Exercise 3: Adding Elements and Comments to an XML Document
- Exercise 4: Modifying and Deleting Information

### Module 7: Transforming XML

This module explains the process of transforming XML documents. The module teaches the student how to apply an XSLT transformation to an XML document by using the .NET XML classes. It does not teach XSLT syntax or commands.

#### Lessons

- Introduction to Transforming XML
- Programming the XslTransform Class
- Extending XSLT Style Sheets

#### Lab 7.1: Transforming XML Documents

- Exercise 1: Applying a Style Sheet
- Exercise 2: Using Style Sheet Parameters
- Exercise 3: Extending a Style Sheet with an Extension Object

### Module 8: Serializing Objects as XML

This module provides students with the skills needed to create XML documents from the data contained within programmatic objects. This process is referred to as serialization and can be used to persist object data or to share object data between applications.

#### Lessons

- Introduction to XML Serialization
- Serializing Objects Using XmlSerializer
- Controlling XML Serialization

#### Lab 8.1: Serializing Objects as XML

- Exercise 1: Serializing a Purchase Order
- Exercise 2: Controlling Serialization with Attributes
- Exercise 3: Deserializing an Invoice