COURSE DESCRIPTION:

The eXtensible Markup Language (XML) is a platform-independent data representation, which may be viewed as a simplified version of SGML designed for the Web. Java Technology and XML are complementary: XML provides a family of technologies that enable portable data, and Java technology enables portable, maintainable code. Together, XML and Java technologies provide comprehensive support for data representation and exchange, and promote a new generation of Presentation Oriented Publishing (POP), Message Oriented Middleware (MOM), and Application Configuration services for the enterprise. While XML-based POP services are being layered on top of J2EE’s Client Container, Java Server Faces, and JSP/Servlet component models, XML-based MOM services provide uniform access to application server and Enterprise Extension and Integration technologies including Business Process Management (BPM), Business to Business Integration (B2Bi), Enterprise Application Integration (EAI), Legacy Extension (LE), and Enterprise Information Integration (EII). As they become core components of the upcoming Web Services platforms (i.e., Sun’s Open Net Environment, Oracle’s Dynamic Services, IBM’s WebSphere platform, and Microsoft .NET), XML-based services provide a foundation for modern component-based and device-independent eBusiness via wire/exchange format protocols (e.g., SOAP, ebXML, BizTalk services, WS-Security), description protocols (e.g., XML Schemas, WSDL, Process Flow Orchestration, BPEL4WS), discovery protocols (e.g., WS-Inspection, UDDI), and presentation/integration facilities.

This course is designed for programmers already familiar with the Java language and class libraries. All instruction and development will be based on the J2SE 1.4.2 (or 1.5.0), and the latest practical W3C, and WS-I standards. Rather than solely focusing the presentation on the various XML features and technologies, the course illustrates how the use of such XML technologies and applications meshes with the modern approach at building XML-based comprehensive business applications. The course provides an in-depth coverage of XML-based Java-enabled functionality. Students will learn how to specify, and
manipulate XML data from Java programs using existing implementations of the current W3C specifications for the Domain Object Model (DOM) and Simple API for XML SAX). Through a set of assignments/projects, students will implement the various components of a sample XML web-enabled and Java-based enterprise application. Students will gain practical exposure to the various XML commercial toolsets being developed by various third-party vendors including BEA, IBM, Microsoft, Sun, and WebMethods.

COURSE OBJECTIVES

The objectives of the course are as follows:

1. Expose the students to the XML family of technologies, and the latest W3C XML and WS-I XML standards.

2. Expand the student’s understanding of the various applications of XML in the areas of information representation, Presentation Oriented Publishing, Message Oriented Computing, Application Configuration, and Web Services Protocols.

3. Expose the students to the combined use of XML and Java technologies to support the development of modern applications targeted to the evolving spectrum of distributed and decentralized enterprise platforms.

4. Expose the students to the advanced XML-enabled capabilities of the Java 2 development environment for Enterprise Applications.

5. Demonstrate the use of XML to support the modern approach at building comprehensive business applications using XML Markup Language technologies, XML information modeling, XML information processing, XML information rendering, XML information retrieval, XML-Based frameworks, and XML application implementation and testing methodologies and tools.

6. Demonstrate the application of XML in distributed communications enabling, enterprise systems assurance, web enabling, application enabling, and enterprise data enabling.

7. Expand student’s understanding of the current industry support for XML technologies including the standard domain- and industry-specific applications of XML published on the W3C or OASIS Web sites, core XML technologies used to support enterprise frameworks (e.g., J2EE, .Net, and CORBA 3), and XML technologies used to support specific architectural patterns such as Service Oriented Architectures (e.g., Web Services platforms), P2P platforms, Grid Computing platforms, Brick by Brick computing, etc.
8. Sharpen the student’s practical development skills via focused assignments and projects.

TEXTBOOKS

XML and Java: Developing Web Applications, Second Edition
Hiroshi Maruyama et al.
Addison Wesley Professional, ISBN: 0-201-77004-0 (05/02)

Processing XML with Java: A Guide to SAX, DOM, JDOM, JAXP, and TrAX
Elliotte Rusty Harold
Addison Wesley Professional, ISBN: 0-201-77186-1 (11/02)

Building Web Services with Java: Making Sense of XML, SOAP, WSDL, and UDDI
Secure Web Services Using Java
Steve Graham et al.
Sams, ISBN: 0-672-32641-8 (06/04)

PREREQUISITES

Students enrolling in this class are expected to have taken G22.1170 (Fundamental algorithms), Programming for the World Wide Web, and their prerequisites or to have equivalent knowledge. Students are also expected to have taken a Java intermediate course, and to have basic knowledge of the Core JFC classes, and the ability to program in Java.

WEB SITES

COURSE SESSIONS

1. Markup Language Technologies (Part I)
   - Meta-Markup Languages
   - Markup Languages
   - Working with XML Editors, DTD and Schema Editors
   - Ongoing Project Overview

   **READINGS:** XML and Java: Chapter 1, Appendices A and B
   Processing XML with Java: Chapter 1, Appendix C
   Building Web Services with Java: Chapter 1
   Handouts posted on the course web site

2. Markup Language Technologies (Part II)
   - The Current State of the XML Standard
   - Advanced Markup Languages
   - Style Specification Languages
   - Working with XSL, Stylesheet Editors, XSL Debuggers

   **READINGS:** XML and Java: Chapter 1, Appendices A, B, and C
   Processing XML with Java: Chap. 1, Appendix C
   Building Web Services with Java: Chapters 1-2
   Handouts posted on the course web site

3. XML Information Modeling (Part I)
   - XML Physical Entities
   - Logical Structure of XML Documents
   - XML Document Navigation
   - Custom Markup Languages

   **READINGS:** XML and Java: Chap. 9, 16, Appendices A, B, and C
   Processing XML with Java: Chapter 1, Appendix C
   Building Web Services with Java: Chapters 1-2
   Handouts posted on the course web site

4. XML Information Modeling (Part II)
   - Advanced Logical Structuring and XML Schemas
   - XML Metadata Management
   - XML Linking/Pointer Language, XML Base, and XML Inclusions
   - XML Data Binding
   - Industry Specific Markup Languages
   - Introduction to Parsing/Generating/Serializing XML Docs
   - Working with Metadata Management Tools
5. **XML Information Processing (Part I)**

- Simple API for XML (SAX)
- XML Parsers
- JAXP APIs
- Working with XML Parsers and Coding Assist Tools

**READINGS:** XML and Java: Chapter 5, Appendices A and B
Processing XML with Java: Chapters 6-8, Appendix C
Building Web Services with Java: Chapters 7-8
Handouts posted on the course web site

6. **XML Information Processing (Part II)**

- Document Object Model (DOM)
- The JDOM Model
- Advanced XML Parser Technology
- Latest W3C APIs and Standards for Processing XML

**READINGS:** XML and Java: Chapters 4, 6, Appendices A-C
Processing XML with Java: Chap. 5, 9-15, Appendix A
Handouts posted on the course web site

7. **XML Information Rendering (PART I)**

- Extensible Stylesheet Language Transformation (XSLT)
- Extensible Stylesheet Language Formatting Object (XSL-FO)
- XML and Document/Content Management
- Introduction to XML Application Servers
- Working with XSLT and XSL-FO Processors

**READINGS:** XML and Java: Chapters 7, 10, Appendices A and B
Processing XML with Java: Chapters 16-17, App. C
Handouts posted on the course web site

8. **XML Information Rendering (PART II)**

- XML/XSL and JSP/JavaBeans Rendering Technology
- Internationalization Issues
- Web Content Accessibility Guidelines (WCAG)
- Web Services

**READINGS:** XML and Java: Chapter 13  
Processing XML with Java: Chapter 2, Appendix B  
Building Web Services with Java: Chapters 3-5, 7, 10  
Handouts posted on the course web site

9. **XML Information Retrieval (PART I)**

- Applications of XML to Database Technology  
- XML Queries  
- XML Query Languages  
- XML Registries API  
- .Net Web Services

**READINGS:** XML and Java: Chapter 11, Appendix D  
Processing XML with Java: Appendix C  
Building Web Services with Java: Chapters 6, 11  
Handouts posted on the course web site

10. **XML Information Retrieval (Part II)**

- XML Object Persistence  
- Advanced XML-QL  
- XQuery: A Query Language for XML

**READINGS:** XML and Java: Chapter 11, Appendix D  
Handouts posted on the course web site

11. **XML-Based Frameworks and Additional XML Services**

- Presentation Oriented Publishing (POP) Frameworks  
- Client-Side XML POP Frameworks  
- Server-Side XML POP Frameworks  
- XML Message Oriented Middleware (MOM) Frameworks  
- XML Messaging  
- XML Security

**READINGS:** XML and Java: Chapter 12, 14  
Building Web Services with Java: Chapter 9, 12-14  
Handouts posted on the course web site

**READINGS**

Assigned readings for the course will be from the textbook, from various web sites documentation, and from trade magazines and recommended books listed on the course web site.
ASSIGNMENTS

Homework and project assignments completion will be required. Quizzes will be administered. The final exam will be a take-home exam.

GRADING POLICY

25% Assignments
35% Projects
30% Final Exam
10% Attendance and Participation
Extra credit will be granted periodically for particularly clever or creative solutions.
SESSION OBJECTIVES

1. Introduce Markup Language Technologies
2. Understand course structure and objectives
3. Discuss Meta-Markup Languages
4. Discuss Markup Languages
5. Introduce XML, DTD, and Schema Editors
6. Describe the class project

SESSION OUTLINE

• Review course administration and course structure
• Review course goals and syllabus
• Introduce Meta-Markup Languages
  ▪ Standard Generalized Markup Language
  ▪ The family of XML technologies
• Discuss Markup Languages
  ▪ Hypermedia/Time-based Structuring Language (HyTime)
  ▪ HTML
  ▪ XML Presentation Oriented Publishing (POP) Applications
• Survey XML Editors, DTD and Schema Editors
  ▪ Altova’s XMLSpy Enterprise Edition
  ▪ XML Notepad, XML Pro, XMLwriter, Visual XML, etc.
  ▪ Survey XML editors
  ▪ Survey DTD and schema editors
• Class project
  ▪ The project will consist of providing custom XML-based services to support the various aspects of your own selected portable application. The application can be targeted to end-users (B2C), businesses (B2B), developers (toolkit). As an example, you could implement and XML-based training studio supporting VoiceXML, and application-sharing capabilities.
  ▪ Sample applications used in the past fell in the category of “multi-channel online community platforms”, and included applications such as “community-based shopping”. In that context, examples of useful XML-based services to support these platforms may include synchronized multimedia presentation viewing, and “offline” chat capabilities. A sample specification of the online community platform for a virtual university eBusiness application that was used in the past for this course will be provided for illustration purpose.

ASSIGNMENT

• Assignment #1a:
  ▪ Explore the textbooks’ CDs, and the textbook references to XML tools
• Install and experiment with XML editors. Settle on a tool you feel comfortable using, and come up with a small application of XML (and possibly an XML application) that demonstrates the use of that tool. Write a short report that uses your sample application to document your findings and recommendations with respect to selection criteria in support of XML editors.

• Read suggested introductory textbook chapters, and handouts
• Read selected articles at http://java.sun.com/developer/technicalArticles/xml/.
• Read article at http://java.sun.com/features/2001/02/xmlj2ee.html.
SESSION OBJECTIVES

1. Describe the current state of the XML standard
2. Discuss advanced Applications of XML
3. Discuss XML style specification languages
4. Illustrate working with XSL, Stylesheet Editors, and XSL Debuggers

SESSION OUTLINE

• Review previous session
• Assess the current state of the XML standard
• Discuss advanced XML applications
  ▪ XHTML 1.0 and Xforms 1.0
  ▪ XML Message-Oriented Middleware (MOM) Applications
• Review style specification languages
  ▪ Document Style Semantics and Specification Language (DSSSL)
  ▪ Cascading Stylesheet (CSS)
• Demonstrate XSL editors, debuggers, XSLT processors, etc.
  ▪ XML Spy Stylesheet Editor, IBM XSL Editor, etc.
  ▪ XSLDebugger, etc.
  ▪ FOP XSLT processor, etc.

ASSIGNMENT

• Assignment #1b:
  ▪ Review the class project description, and the virtual university sample eBusiness application specification
  ▪ Come up with your own variant of an XML-based portable application
  ▪ Specify a set of services that would need to be provided to support your portable application
  ▪ Provide a written specification of your overall framework (i.e., platform and services), and propose a staged development approach that would demonstrate the use of XML to support the modern approach at building comprehensive business applications suggested in this course. Your proposed approach should include the use of XML Markup Language technologies, XML information modeling, XML information processing, XML information rendering, XML information retrieval, XML-Based frameworks, and XML application implementation and testing methodologies and tools
• Read suggested textbook chapters, and handouts on XML markup language technologies
SESSION OBJECTIVES

1. Introduce XML Physical Entities
2. Describe the Logical Structure of XML Documents
3. Discuss XML Document Navigation
4. Survey Custom Markup Languages

SESSION OUTLINE

- Review previous session
- XML Physical Entities
- Electronic Document Markup and XML
- Logical Structure of XML Documents
  - Namespaces 1.0
  - Document Type Definitions (DTDs)
  - XML Schemas (Structures, and Data Types)
  - XML Document Navigation (URIs/URLs, and XPath)
- Custom Markup Languages
  - Mathematical Markup Language (MathML)
  - OpenMath
  - Chemical Markup Language (CML)
  - Bioinformatic Markup Language
  - Geography Markup Language (GML)
  - Wireless Markup Language (WML)
  - Synchronized Multimedia Integration Language (SMIL)
  - Synchronized Vector Graphics (SVG)
  - Extensible 3D (X3D)
  - XML-Based User Interface Language (XUL)
  - Extensible Log Format (XLF)

ASSIGNMENT

- Assignment #2a:
  - This part of the project focuses on the application business model discovery using XML information modeling technology. The discovery process should adhere to the following steps: (a) Documenting the information structure, (b) Representing the information structure in XML form, (c) Defining XML DTDs and/or Schemas
  - More specific project related information, and extra credit assignments will be provided during the session
- Read suggested textbook chapters, and handouts on XML information modeling
XML FOR JAVA DEVELOPERS
Session 4 - XML Information Modeling (Part II)

SESSION OBJECTIVES

1. Discuss advanced logical structuring and XML Schemas
2. Discuss XML Metadata Management
3. Study the XML Linking Language (XLink), XML Base, XML Inclusions (XInclude), and XML Pointer Language (XPointer)
4. Introduce the XML Data Binding for the Java platform
5. Survey industry specific markup languages
6. Discuss Parsing/Generating/Serializing XML Documents
7. Demonstrate the use of Metadata Management Tools

SESSION OUTLINE

• Review previous session
• Advanced Logical Structuring and XML schemas
  ▪ Digital Signatures
  ▪ Canonical XML
  ▪ XML Information Set (Infoset)
  ▪ XML Fragments
  ▪ XML Schema Adjuncts
• XML Metadata Management
  ▪ Unified Modeling Language (UML)
  ▪ OMG’s Meta-Object Facility (MOF) and XML Metadata Interchange (XMI)
  ▪ Microsoft’s XML Interchange Format (XIF) and the Open Information Model (OIM)
  ▪ XML metadata management tools
    ▪ IBM’s XMI toolkit, etc.
• XLink, XML Base, XInclude, and XPointer
• Industry specific markup languages
  ▪ Extensible Business Reporting Language (XBRL)
  ▪ Bank Internet Payment System (BIPS)
  ▪ Microsoft BizTalk Framework (Windows 2000)
  ▪ Electronic Business XML (EbXML)
  ▪ Privacy-Enabled Customer Data Interchange (CPEXchange)
  ▪ Visa XML Invoice Specification
  ▪ Commerce XML (cXML)
  ▪ Legal XML
  ▪ NewsML
  ▪ Electronic Catalog XML (eCX)
  ▪ Open eBook Publication Structure
• Using Sun XML Pack, and Apaches’ Xerces to parse/generate/serialize documents
• Using XMLSpy, and MOF-based Metadata management tools

ASSIGNMENT
• Assignment #2b:
  ▪ This part of the project relies on the business model discovery process suggested in assignment #2a, and should demonstrate the use of UML use cases to support the development of XML DTDs and/or Schemas
• Read suggested textbook chapters, and handouts on XML information modeling
XML FOR JAVA DEVELOPERS
Session 5 - XML Information Processing (Part I)

SESSION OBJECTIVES

1. Discuss the Simple API for XML (SAX)
2. Study related XML parsers
3. Study related JAXP APIs
4. Work with XML Parsers and Coding Assist Tools

SESSION OUTLINE

- Review previous session
- Simple API for XML (SAX)
  - Events
  - Character handling
  - Exception handling
- XML Parsers
  - Well-formedness and validity
  - Mainstream parsers comparison (XercesJ, Oracle’s XML parser for Java, and Expat)
- Parsers and Coding Assist Tools
  - Sun XML Pack
  - XML Spy
  - Java IDEs
  - Oracle XML Parser, Sun’s Crimson, IBM’s XML4J, Apache’s XercesJ, etc.
  - JAXP Parsers: Docuverse’s Minimal XML Parser, etc.
  - XML Coding assist tools and user interface tools
    - XML Spy, IBM WSAD, VBXML’s Visual XSL, etc.

ASSIGNMENT

- Assignment #3:
  - This part of the project focuses on the application process model design/development using XML information processing technology. The design/development process should adhere to the following steps: (a) Identifying the points of data integration, (b) Defining the optimal integration approach at each point, (c) Establishing linking relationships, and (d) Considering data integration and linking issues when designing an overall application data model.
  - More specific project related information, and extra credit assignments will be provided during the session.
- Read suggested textbook chapters, and handouts on XML information processing.
XML FOR JAVA DEVELOPERS
Session 6 – XML Information Processing (Part II)

SESSION OBJECTIVES

1. Study the Document Object Model (DOM)
2. Study the JDOM Model
3. Study advanced XML parsing technology
4. Discuss the latest W3C APIs and standards for processing XML

SESSION OUTLINE

• Review previous session
• Document Object Model (DOM)
  ▪ DOM API
  ▪ Creating a Document Using DOM
• JDOM
  ▪ Java-Centric Document API for XML
• Advanced XML Parser Technology
  ▪ JAXP: Java API for XML processing
  ▪ DOM, SAX, JDOM, and JAXP comparison
• Latest W3C APIs and standards for processing XML
  ▪ XML Infoset
  ▪ DOM Level 3
  ▪ Canonical XML
  ▪ XML Signatures
  ▪ XBase
  ▪ XInclude
  ▪ XPointers

ASSIGNMENT

• Assignment #3: (continued from session 5)
• Read suggested textbook chapters, and handouts on XML information processing
SESSION OBJECTIVES

1. Study the Extensible Stylesheet Language Transformation (XSLT)
2. Study the Extensible Stylesheet Language Formatting Object (XSL-FO)
3. Discuss XML and document/content management
4. Introduction to XML Application Servers
5. Working with XSLT and XSL-FO Processors

SESSION OUTLINE

• Review previous session
• Extensible Stylesheet Language Transformation (XSLT)
  ▪ Templates
  ▪ Creating elements and attributes
  ▪ Iterations and sorting
  ▪ Conditional processing
  ▪ Copying nodes
  ▪ Combining stylesheets
  ▪ Variables and parameters
  ▪ Scripting and XSLT
• Extensible Stylesheet Language Formatting Object (XSL-FO)
  ▪ Setup
  ▪ Document page
  ▪ Document text
  ▪ Lists
• XML and document/content management
  ▪ Rendering XML into HTML or other data formats
  ▪ Whitespace issues
  ▪ XML catalog/repository
• Using XML in Application Servers
  ▪ XML and OMG’s CORBA 3 Object Management Architecture (OMA)
  ▪ XML and J2EE
    ▪ XML data representation and exchange via the EJB persistence service
    ▪ XML MOM via the Java Messaging Service (JMS)
    ▪ Presentation via Java Server Pages (JSPs) and Servlets
  ▪ XML and Microsoft .Net
• Survey of XSLT and XSL-FO processors

ASSIGNMENT

• Assignment #4:
  ▪ This part of the project focuses on the application content model design/development using XML information rendering technology. The
design/development process should adhere to the following steps: (a) Identifying rendering/ transformation targets, (b) Defining the optimal rendering approach for each target, (c) Considering data rendering issues when designing an overall application data model

- More specific project related information, and extra credit assignments will be provided during the session

- Read suggested textbook chapters, and handouts on XML information rendering
**XML FOR JAVA DEVELOPERS**

**Session 8 – XML Information Rendering (Part II)**

**SESSION OBJECTIVES**

1. Discuss XML/XSL and JSP/JavaBeans rendering technology
2. Study internationalization issues
3. Introduce the Web Content Accessibility Guidelines (WCAG)
4. Introduce Web Services

**SESSION OUTLINE**

- Review previous session
- JSP-based rendering technology
  - Loading and converting XML into JavaBeans components referenced in JSP pages
  - XML-based custom JSP tags
  - Invoking an XSLT processor via custom JSP tags
  - On-the-fly XSLT transformations using Java servlet filters
- Internationalization issues
- Web Content Accessibility Guidelines (WCAG)
  - User Agent Accessibility Guidelines 1.0
- Building a Web Service
  - Content, discovery, universal access, and intelligent software agents
  - Peer-to-Peer (P2P) computing
  - XML-Based e-Services protocols and architectures
    - XML-RPC
    - Simple Object Application Protocol (SOAP)
    - Universal Description, Discovery, and Integration (UDDI)
    - Web Service Definition Language (WSDL)
    - Resource Description Framework (RDF)
      - Platform for Internet Content Selection (PICS)
      - Platform for Privacy Preferences (P3P)
      - Channel Definition Format (CDF)
      - Rich Site Summary (RSS)
      - Blocks Extensible Exchange Protocol (BXXP)

**ASSIGNMENT**

- Assignment #4: (continued from session 7)
- Read suggested textbook chapters, and handouts on XML information rendering
XML FOR JAVA DEVELOPERS
Session 9 - XML Information Retrieval (Part I)

SESSION OBJECTIVES

1. Survey the applications of XML to database technology
2. Introduce XML Queries
3. Discuss XML query languages
4. Discuss XML registries API
5. Introduce .Net Web Services

SESSION OUTLINE

- Review previous session
- Applications of XML to database technology
  ▪ Properties of relational database queries
  ▪ Mapping XML to a relational database
  ▪ JDBC refresher
  ▪ SQL embedded in XML (SQLX)
- XML Queries
  ▪ Requirements
  ▪ Use cases
  ▪ Properties of relational database queries
- XML query languages
  ▪ XQL/XML-QL
  ▪ DB2XML
  ▪ Using Oracle and XML
- XML registries
  ▪ UDDI
  ▪ BizTalk Registry
- .Net Web Services
  ▪ Building Web Services with the Microsoft .NET platform

ASSIGNMENT

- Assignment #5a:
  ▪ This part of the project focuses on the application data model design/development using XML information retrieval technology. The design/development process should focus initially on identifying the data to be retrieved for resulting subsets of data
  ▪ More specific project related information, and extra credit assignments will be provided during the session
- Read suggested textbook chapters, and handouts on XML information retrieval
SESSION OBJECTIVES

1. Study XML object persistence
2. Study advanced XML-QL/XQL concepts
3. Introduce XQuery, a query language for XML
4. Discuss the use of the SAX and DOM APIs with a database
5. XML Server Pages

SESSION OUTLINE

• Review previous session
• XML object persistence
  ▪ SOAP-style formatting
  ▪ Evolution and versioning/Abstract Data Layer (ADL)
  ▪ XML, and Databases
    ▪ XML and JDBC
    ▪ XML Extensions and Tools for Oracle, Informix, IBM DB2, and Microsoft SQL Server
• Advanced XML-QL/XQL concepts
  ▪ XML query data model
  ▪ XML query algebra
• XQuery
• Using the SAX and DOM APIs with a database
  ▪ Rowset transformations using SAX/DOM APIs
  ▪Disconnected rowsets
• XML Server Pages (XSP)
  ▪ Cocoon and XSP

ASSIGNMENT

• Assignment #5b:
  ▪ This part of the project relies on the application data model design/development process suggested in assignment #5a, and should focus on demonstrating the following additional steps: (a) Defining the optimal retrieval approach for each dataset, and (b) Considering query constraints when designing an overall application data model
  ▪ More specific project related information, and extra credit assignments will be provided during the session
• Read suggested textbook chapters, and handouts on XML information retrieval
SESSION OBJECTIVES

1. Introduce Presentation Oriented Publishing (POP) frameworks
2. Study client-side XML POP frameworks
3. Study server-side XML POP frameworks
4. XML Message Oriented Middleware (MOM) Frameworks
5. XML Messaging and Security
6. Course material review
7. Final project description

SESSION OUTLINE

- POP application support infrastructures
  - POP and OMG’s CORBA 3 horizontal facilities
  - Related component models (JSP/JavaBeans, XSP, Servlet filters, etc.)
- Client-side XML POP frameworks
  - Microsoft Internet Explorer (IE5/IE6)
- Server-side XML POP frameworks
  - Dynamic XML servers
  - Rocket
  - Cocoon
  - Perl-based POP frameworks
- MOM Frameworks
  - MOM application development tools
    - Serializing Java objects into XML using reflection
    - Developing MOM applications using the SAX/DOM APIs
  - B2B commerce and Enterprise Application Integration (EAI) Frameworks
    - B2B patterns for the transformation and routing of XML documents
    - WebMethods B2Bi EAI framework
    - Integrating legacy systems using XML and Microsoft Message Queue
  - BEA frameworks
  - Sun’s Open Net Environment (ONE)
  - Oracle’s Dynamic Services platform
  - IBM WebSphere Architecture (WSA) platform
- Application Servers and Web Services Messaging and Security
  - XML Protocol (XMLP): XML-Based Messaging Systems
    - XML messaging (via HTTP, and MQSeries)
  - XML and User Identification/Security
  - WS-I services
- Final Exam Discussion

ASSIGNMENT

- Final Exam (take home project):
  - The exam will focus on the discovery/design/development of an XML-Based application architecture using XML-Based frameworks. A specific
architectural pattern will be considered for the final exam. As it relates to the presentation layer for XML-based architectures, the discovery/design/development process should adhere to the following steps: (a) Determining how W3C recommendations will be applied (e.g., determine when DOM is appropriate, etc.), (b) Using the details and syntax of core W3C recommendations (XML, XSL, DOM, XPath, namespaces, DTDs, XML well-formedness, Schemas, etc.), (c) Refining the application presentation layer architecture design as necessary based on data model, data integration, data rendering, and data query issues. Particular care should be taken at determining the implications of a given architecture on the overall XML design related considerations.

- The exam will also emphasizes application deployment using XML implementation and testing technology. In general, application deployment process should adhere to the following steps: (a) Determining an optimal development environment using standard tools as appropriate, (b) Determining the best use of APIs to XSL and XML processors, (c) Assessing performance tradeoffs, (d) Implementing a given design using XML data modeling, data integration, and data rendering capabilities and corresponding functional components and interconnections among functional components, (e) Creating instances to test based on the application data model and boundary cases, and (f) Addressing exceptions such as parser errors, and DOM errors.

- More specific information will be provided throughout the course

- Read suggested textbook chapters, and handouts on XML-based frameworks