



FD'02

CIS 480:  
XML Applications

*Syllabus*  
*R. Maruyama*

## Course Description

Introduction to XML Applications. Covers *well-formed* and *valid* XML documents, DTD, their display using CSS and other techniques, and application examples. Presumes familiarity with HTML and VBScript. Includes review of CSS. Prerequisite: CIS 420 or instructor's consent.

XML (Extensible Markup Language) XML is fast becoming a favored technology for delivering and manipulating data over the Internet. The traditional HTML has been pressed to perform far beyond its intended goal, which was to display information that is distributed over the World Wide Web. XML, which allows for structuring of data giving meaning to its contents, provides more efficient and powerful data manipulation techniques over the Internet. XML does not replace HTML, but it makes use of it, along with other technologies, to enable users new and better ways of manipulating and presenting information over the Web.

This course provides an introduction to XML and some attendant technologies. It begins with a quick review of HTML, CSS, and XHTML and covers in depth XML syntax (well-formed documents), semantics (valid documents), and displaying of XML documents. It concludes with examples of how XML is used in various applications.

## Course Objectives

After studying this course the student is expected to be able to:

- Distinguish between displaying data and structuring data
- Distinguish between well-formed and valid XML documents
- Write well-formed and valid XML documents
- Write basic Data Type Definitions
- Differentiate DTD and Schemas
- Show the relationship among XML, HTML, and CSS
- Explain how XML works with XSL, XPath, XPointer, and other related technologies
- To be able to follow in the professional literature, WWW, newspapers, and other forms of media the developments in applications involving XML

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## Text Book

*Required*

XML Step By Step, 2nd Edition by Michael J. Young. Microsoft Press, 2002. ISBN: 0-7356-1465-2

## *Recommended*

*The Web Wizard's Guide to XML*, by Cheryl M. Hughes Addison Wesley, 2002. ISBN: 0-201-76990-5. A compact introduction to XML documents, DTD, Schemas, Style Sheets, and XML Programming, with examples and summaries that are surprisingly understandable in a small book.

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## Topics

The following topics will be covered during the semester in varying depths. Some topics will require a more thorough coverage because they are new to most of you--e.g., *XML Data Type Definitions (DTD)* and *Document Object Model (DOM)*-- while other topics will be a review and will require less amount of time--e.g., CSS.

The following is a summary of topics to be covered in this class. For the most part these topics will covered in the order as they are presented in the text book.

1. XML
  - o What is it?
  - o Why is it a good thing?
  - o What is the difference between a *well formed* XML document and a *valid* document?
2. Creating Well Formed XML Documents
  - o Adding elements
  - o Adding attributes
  - o Adding comments
  - o Adding CDATA sections
3. Creating Valid XML Documents
  - o Creating Document Type Definitions
  - o Difference between DTD definition and DTD declaration
  - o Using namespaces
  - o Adding internal entities and character entities
4. Using CSS to Display XML Documents
  - o CSS rules
  - o Basic HTML element properties
  - o Advanced HTML element properties
5. Using Data Binding to Display XML Documents
  - o Linking XML document to HTML page
  - o Binding HTML elements to XML element
6. Understanding Document Object Model
  - o What is DOM?
  - o Using DOM to display XML document
7. XML Applications
  - o What can you do with XML?
  - o XML technologies--SAX, WAP, SVG, OFX, MathML, CML, etc.

## Requirements

The following is a summary of what is expected of you for the course. Refer to the section on Grading for further details.

- Readings, exercises in the text book
- Project Assignments\*
- Presentation\*
- Final Exam\*

(\*These elements will be graded.)

Since this is an online course, you are expected to be more independent than usual, and majority of your efforts will be directed toward readings, exercises, and projects. We plan to meet physically at the following times: a) introductory session at the start of the course; b) final exam at the end of the course; b) two class sessions near the end of the term--exact dates to be decided--for presentation of research topics. In between these two sessions, throughout the term, I will make myself available on a regularly scheduled basis to answer any question you might have regarding project assignments.

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## Project Assignments

The main goal in this class is that you learn how to write XML documents and understand how they are used. The surest way for you to learn the concepts and implementation is to practice writing them, while studying good examples. A total of eight project assignments are scheduled for the course. They are based on the examples presented in the text book and are further explained in the class notes that can be linked from the class Schedule Web page. They are to be completed at home and submitted via email as attachments. They must be submitted by midnight of the date specified in the Schedule page.

In order to encourage you to keep up with the schedule, penalty points will be deducted at the following rate: 1 day late, 10%; 2 - 4 days late, 30%; 5 - 7 days late, 50%. It is always better to submit an assignment late than not at all. However, the maximum credit for an assignment that is late by a week or more is 50%. If you foresee a valid reason that could cause you to turn in your assignments late--e.g., TDY, special assignment, accidents, etc.--you must get permission for special arrangements *before the programming assignment is due*.

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## Presentation

XML is a powerful technology, which is expected to be utilized in a wide range of application in business and technical environments. However, it takes a wide range of related technologies to make full use of it, many of which are yet being developed standardized. Although it is beyond the scope of this course to study them in detail, you should have a basic familiarity with some of the important ones.

In addition to the projects which are due at regular intervals, another requirement for this course is that you choose one of these technologies from the list that follows, conduct a research on the topic, and present what you learned to the rest of the class.

This procedure serves at least two purposes. First, by sharing the results of your research with the class, everyone has a chance to become familiar with a wide range of topics, which otherwise, would be difficult to cover by yourself. The second benefit of the presentation before class is that it offers an opportunity for you to speak before an audience and make your ideas understood. Chaminade's educational policies place high priority on developing oral communication skills in students. The presentations should be 10 minutes in length and emphasize explanation of the concepts to the audience so that they understand what you are explaining.

Choose one of the following topics for your research and presentation. Each student should be responsible for a different topic. When you have chosen a topic, send your choice via email to the following address:

To: *maruyamark@yahoo.com*  
Subject: *CIS480*

After someone chooses a particular topic and emails it in, it will be ~~crossed out from the list like this~~.

Some of these topics are accompanied by suggested URLs to get you started. A good source to begin is Webpoedia, which provides definition of almost any computer-related term, as well as links to further explanations.

#### XSL (XML Stylesheet Language)

CSS, which was originally developed for HTML, can be used also with XML to display its contents. XSL is a more powerful method, which includes not only formatting instructions but allows programming capabilities.

#### SAX (Simple Application Programming Interface for XML)

DOM (Document Object Model) provides a method for manipulating elements in an XML document. SAX offers alternative way.

#### XML and Programming Languages

The DOM provides a way to manipulate XML documents using any of the popular programming languages, like C++, Java, and Perl.

#### XML and Databases

Primary use of XML documents is for storing data. But the hierarchical structure of XML elements differ from the table structure and relationships in the Relational Database. There are benefits and, and disadvantages, for both types, depending on circumstances.

#### MathML (Mathematical Markup Language) <http://www.w3c.org/Math>

XML is a metalanguage, which allows creation of new languages. MathML is one of the earliest such applications to display and manipulate mathematical expressions.

#### CML (Chemical Markup Language) <http://www.xml-cml.org>

CML was developed to describe chemical formulas, equations, and molecular information. It has interfaces to various programming languages including C++ and Java.

SVG (Scalable Vector Graphics) <http://www.w3c.org/Graphics/SVG>  
 SVG is a standard for describing two-dimensional graphics in XML. It is, as many XML-related technologies are, a developing standard.

OFX (Open Financial Exchange) <http://ofx.net>  
 OFX specifies rules for supporting a wide range of financial activities among business institutions and consumers, in such areas as banking, bill payment, investment tracking of stocks, bonds, and mutual funds.

WAP (Wireless Application Protocol) <http://www.wapforum.org>  
 WAP provides specification for wireless devices, as a standard markup language for viewing content on wireless devices, like HTML is for viewing Web contents.

DOM (Document Object Model)  
 DOM specifies how objects in a Web page (text, images, headers, links, etc.) are represented, so that they can be manipulated by various scripts.

SOAP (Simple Object Access Protocol)  
 specifies a way for applications to communicate with each other ver the Internet, regardless of the operating systems used, using XML-bases messages.

SMIL (Synchronizing Multimedia Integration Language)  
 The language allows developers to divide multimedia content into audio, video, text, and image files and streams, to be sent to the user's computer separately, then to be displayed as a single multimedia stream. The technique speeds up transmission.

BSML (Bioinformatic Sequence Markup Language)  
 allows for encoding of DNA, RNA, and protein sequences

DESSERT (Document Encoding STuring Specification for Electronic Recipe Transfer)  
 stores recipe information in a database

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## Submitting One's Own Work

Each student is expected to write his or her own programs. Since the main goals in this class is that each student learn the basic skill in developing XML documents, it is important that you write your own code in each exercising. You must distinguish between consulting your friends or discussing problems with them from copying other people's work. Even if you "work together," **the solutions you submit must be your own work**. The penalty for copying in project assignments, either in whole as well as in part, is, for the first offense, a grade of 0 for all parties involved; for the second offense, an *F* for the course.

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## Grading

The determination of the final course grades will be guided by the following distribution of course elements.

Project	30 x 8	240 pts
Assignments		
Presentation	60 x 1	60 pts

Final Exam	100 x 1	100 pts
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Total		400 pts

The following guidelines will be used in determining the final grades.

A: = 90% B: = 80% C: = 70% D: = 60% F: < 60%

\* A minimum of 6 completed projects is a necessary condition for a passing grade.

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## Getting Help

For "quick" questions the email is the simplest way to contact me. Feel free to drop in at my office during office hours or to set up an appointments outside those hours. (I am around my office usually in the afternoon.) When you need help in debugging programs, bring a copy of the code that is causing the problem.



● [Syllabus](#) ● **[Schedule](#)** ● [Resources](#) ● [Records](#) ● [Office](#) ● [Home](#)

Week	Starting	Topic	Class Notes	Text Book Reading	Assignment Due
1	8/26	<ul style="list-style-type: none"><li>● Syllabus</li><li>● Introduction</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">Syllabus</a></li><li>● <a href="#">Basic Tools</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 1: p1 - 19</li></ul>	
2	9/2	<ul style="list-style-type: none"><li>● Why XML?</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">Notes 1</a></li><li>● <a href="#">Intro to PA</a></li><li>● <a href="#">PA 1</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 2: p 21 - 33</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">PA 1</a></li></ul>
3	9/9	<ul style="list-style-type: none"><li>● Your First XML Doc.</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">Notes 2</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 2: p 34 - 4</li></ul>	
4	9/16	<ul style="list-style-type: none"><li>● Well Formed XML Doc.</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">PA 2</a></li></ul>		<ul style="list-style-type: none"><li>● <a href="#">PA 2</a></li></ul>
5	9/23	<ul style="list-style-type: none"><li>● XML Attributes</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">Notes 3</a></li><li>● <a href="#">PA 3</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 3: p 45 - 69</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">PA 3</a></li></ul>
6	9/30	<ul style="list-style-type: none"><li>● CDATA Section</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">Notes 4</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 3: 69 - 80</li></ul>	
7	10/7	<ul style="list-style-type: none"><li>● Processing Instructions</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">PA 4</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 4: 81 - 89</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">PA 4</a></li></ul>
8	10/14	<ul style="list-style-type: none"><li>● Valid XML Doc.</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">Notes 5</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 5: 91 - 119</li></ul>	<ul style="list-style-type: none"><li>●</li></ul>
9	10/21	<ul style="list-style-type: none"><li>● External Data Type Definition</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">PA 5</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 5: 120 - 130</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">PA 5</a></li></ul>
10	10/28	<ul style="list-style-type: none"><li>● Cascading Style Sheet</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">Notes 6</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 6: p 131 - 139</li></ul>	
11	11/4		<ul style="list-style-type: none"><li>● <a href="#">PA 6</a></li></ul>		<ul style="list-style-type: none"><li>● <a href="#">PA 6</a></li></ul>
12	11/11	<ul style="list-style-type: none"><li>● Data Binding</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">Notes 7</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 8: 195 - 234</li></ul>	
13	11/18	<ul style="list-style-type: none"><li>● Document Object Model</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">Notes 8</a></li></ul>	<ul style="list-style-type: none"><li>● Ch 10: 297 - 344</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">PA 7</a></li><li>●</li></ul>
14	11/25				
15	12/2	<ul style="list-style-type: none"><li>● More DOM</li></ul>	<ul style="list-style-type: none"><li>● <a href="#">PA 8</a></li></ul>		<ul style="list-style-type: none"><li>● <a href="#">Presentation</a></li><li>● <a href="#">Presenter List</a></li></ul>
16	12/9	<ul style="list-style-type: none"><li>● Final Exam (3-5 p.m.)</li></ul>			<ul style="list-style-type: none"><li>● <a href="#">PA8</a></li></ul>