

## Beginning XML Programming - MV4920 (4-0)

- Synopsis** An introduction to the Extensible Markup Language (XML) and its related family of markup languages. The focus of this research seminar is design projects that include XML content, XML programming, and surveys of new XML development activities.
- Instructor** Don Brutzman      Root 200 1.831.656.2149, home 1.831.372.0190  
*brutzman@nps.navy.mil*    <http://web.nps.navy.mil/~brutzman>
- Office hours are anytime you find me there. Usually I am available as indicated by the schedule posted outside my office. Make an appointment if you want to be sure to see me. If necessary you may call me at home (earlier than 2200 please).
- Schedule** Monday through Thursday 1000-1050, Root 262. Exams are project demos. Spanagel 256 Graphics Lab and Root 228 lab are normally available for your use.
- No class held during holidays, SIGGRAPH conference or MOVES Open House.
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| August 10-17    | SIGGRAPH conference <a href="http://www.siggraph.org/s2001">http://www.siggraph.org/s2001</a>                    |
| August 28-30    | MOVES Open House <a href="http://MovesInstitute.org/OpenHouse.html">http://MovesInstitute.org/OpenHouse.html</a> |
| September 4-7   | Eurographics, Manchester UK <a href="http://www.eg.org/EG2001">http://www.eg.org/EG2001</a>                      |
| September 10-13 | NDIA Undersea Warfare Symposium, Groton Connecticut  |
- Software** The list of software will evolve as we go. For starters:  
<http://www.web3d.org/TaskGroups/x3d/translation/X3D-Edit.zip>  
 Also see online examples matching the full XML textbook at <http://www.wrox.com>
- Textbook** 1. Hunter, David et al., *Beginning XML*, Wrox Press Ltd., Birmingham UK, 2000.  
 Available via <http://www.wrox.com>
- No other textbooks are required for successful completion of this course.  
 There are numerous online references available that will appear (as we go) on the course home page at <http://web.nps.navy.mil/~brutzman/xml>
- Guidelines**
1. You must devote time to reading and programming to succeed in this course.
  2. Students are encouraged to study together. However every assignment submitted must be your own work. Group solutions to project assignments are only acceptable when specified. As in any endeavor your individual integrity is essential. If in doubt, ask.
  3. I am designing this course to significantly help you in your thesis and other courses. Your comments, questions and suggestions are always welcome.

## **Course Objectives**

1. Gain a broad view of XML content, programming and languages
2. Learn XML stylesheet transformations (XSLT)
3. Learn to manipulate XML documents using DOM programming
4. Learn to design tagsets via DTDs and Schema
5. Learn about new XML languages
6. Support thesis work through design projects
7. Use online tutorials and public-domain software
8. Provide tools, techniques and a repeatable methodology that you can use later

## **Class Policy and Study Recommendations**

1. You are learning new ideas and a new language. Thinking and writing in a new language requires fluency. Don't be reluctant to think new thoughts or work hard. Persistence pays.
2. You will get a LOT more out of class by reading assigned material beforehand. Keep ahead of me in your reading. Read each section at least twice. This is a challenging, ambitious course that is worth your while.
3. Discussion and dialog will make class a lot more immediate.
4. Projects make up your entire grade, just like the real world. Exams are boring.
5. Grading is based on merit and performance. I expect everyone to work hard and get an A.
6. You learn how to program solutions to problems by doing. Thus projects and presentations are our products.
7. Students are expected to hand in projects on time. It is your responsibility to contact me in advance for assistance if you are unable to meet an assignment date. I prefer that you hand in something late that is correct, rather than something on time which is broken. Don't get behind, we will follow a fast pace!
8. You must provide an electronic mail address so that I can send messages to the entire class. Numerous online references will be provided that you will need to retrieve. I recommend that you have an NPS home page that serves 3D content as part of this course.

## MV4920 Beginning XML Programming

Week	Chapter		Assignment	Deliverables
<b>1</b> July 9-12	1, 2	Intro to XML	“XML in 10 steps” Install/run X3D-Edit	
<b>2</b> July 16-19	3	HTML/XHTML overview, Cascading Stylesheets quicklook	Install HTML-Kit, Amaya Build a web page	
<b>3</b> July 23-26	4, 5	XSLT and XPath	Install Saxon Build a stylesheet	
<b>4</b> July 30 – August 2	6, 7	Document Object Model, SAX	Install DOM, build a page by programming	Java or EcmaScript
<b>5</b> August 6-9	8, 9	Namespaces, DTDs		<b><u>Stylesheet demos</u></b>
<b>6</b> August 13-16	-	SIGGRAPH Symposium	No class	
<b>7</b> August 20-23	10, 11	Schema and advanced DTD constructs	Final project plans	
<b>8</b> August 27-31	12	XLink, XPointer	Monday class, MOVES Open House	<b><u>Friday: language presentations</u></b>
<b>9</b> September 3-6	-	Project preparation, mail list discussions	No class, Eurographics Symposium	
<b>10</b> September 10-13	-		No class, Undersea Warfare Symposium	
<b>11</b> September 17-20	-	Schematron, review and new topics		<b><u>Project presentations</u></b>
<b>12</b> September 24-27	-	Finals week: Coolness!		<b><u>Project presentations</u></b>

## Deliverables

Your grade will be based on three sets of programming/authoring projects, contributions to the class and a final presentation. Some projects will be individual projects, some will be a group effort. Candidate topics appear on the next page. Final deliverables should include each of the categories:

- ❑ Stylesheet conversions
- ❑ XML Language report
- ❑ XML development programming project

Here are typical final project and report attributes:

- Group approach, or individually designed & executed. We have several interesting ongoing projects that can benefit from improvements and extensions.
- Best approach is work related to your thesis, if possible. Think of this as a prototype.
- Topic mutually agreed upon
- Project outline and methodology proposal
- Deliverables:
  - Slideset
  - minimum five pages of text in report (preferably a draft thesis chapter)
  - at least five references from text bibliography included and evaluated
  - abstract, table of contents, problem statement & solutions, screen snapshots
  - example content
  - appendices: software source code, user guide, session log
  - provide HTML page and links to source code to remain online
  - publishable on the Web
- 25 minute presentation / demonstration to class during exam week

## Candidate XML Projects

- X3D/XML Stylesheets
  - X3D to DOM in Java or EcmaScript
  - X3D to Java3D source (!)
  - Producing Scene Authoring Interface (SAI) in EcmaScript from X3D Schema
  - Merge multiple language tooltips into master X3D Schema
  - SIGGRAPH Online page presentations
  - Dynamic Behavior Protocol (DBP) to Java source
  - SAVAGE virtual environments from operations orders
  
- XML Languages and W3C Activities
  - Scalable Vector Graphics (SVG) <http://www.w3.org/Graphics/SVG>
  - MathML <http://www.w3.org/Math>
  - Chemistry ML <http://www.xml-cml.org>
  - Synchronized Multimedia Integration Language (SMIL) <http://www.w3.org/AudioVideo>
  - DOM Developments <http://www.w3.org/DOM>
  - XHTML/HTML Developments <http://www.w3.org/MarkUp>
  - Resource Description Framework (RDF) <http://www.w3.org/RDF> and Semantic Web <http://www.w3.org/2001/sw>
  - Web Accessibility Initiative (WAI) <http://www.w3.org/WAI>
  - Internationalization (I18N) <http://www.w3.org/International>
  - XML Protocol <http://www.w3.org/2000/xml>
  
- XML Development Projects
  - Common attributes for development projects:
    - Editor using Xena (or other repeatable/reusable tool)
    - Tooltips for tagset elements and attributes
    - Is an autogenerated API (similar to SAI) appropriate?
    - Example content
    - Example programs (using DOM and specialty API)
    - Pertinent tools, including
      - IBM Alphaworks <http://alphaworks.ibm.com>
      - Sun's Java <http://java.sun.com>
      - Apache <http://xml.apache.org>
      - Netscape's Mozilla <http://mozilla.org>
    - Reference list of pertinent books and websites
  - Dynamic Behavior Protocol
  - Message Text Format (XML-MTF)
  - Generic Hub and LC2IEDM Command & Control Model
  - Operations Orders with shared XML-MTF/LC2IEDM tagsets
  
- What is your challenge of interest? Let's discuss it.