

IST 558 Technologies for Website Content Management Fall 2008

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Course Description

This course introduces concepts and techniques in website content representation, organization, presentation, and development with the eXtensible Markup Language (XML) and other related technologies. The course focuses on analysis of document structures and design and implementation of structured contents for websites. Topics include basic XML syntax, XML vocabulary specification, content modeling, XML data retrieval/manipulation, XML stylesheets language programming, and interoperability between XML and relational databases. Students will learn what XML is, how to design the Document Type Definitions (DTDs) and XML schemas, and how to create and manipulate XML documents. Lab exercises, case studies, group discussions, and projects will be used to give students hands-on experience as well as analytical skills in the XML design and implementation process.

Course Objectives

Upon the completion of this course, students are expected to be able to:

- Understand XML concepts and its merits and limitations in content management
- Understand when to use XML
- Understand the syntax and structure of DTDs/schemas and XML documents
- Model and specify XML vocabularies and structures based on analysis of application domains
- Store, retrieve, and manipulate XML data
- Interoperability between XML data and relational data
- Create XML transformation and stylesheet programs to render XML documents in HTML
- Design and implement simple XML applications by using XML tools

Technology Competency

Basic understanding of HTML encoding and database concepts. Knowledge of programming languages will be helpful, but not a necessity.

Graduate students are expected to meet the minimum and recommended information technology literacy skills required of students in all School of Information Studies master's programs. Please refer to: <http://istweb.syr.edu/prospective/graduate/literacyreq.asp> for the "Computer Literacy Requirements" document.

Textbook

- Coles, Michael. (2008). Pro SQL Server 2008 XML. New York: Apress. 1-59059-983-7
- Harold, Elliotte Rusty. (2004). XML 1.1 Bible, 3rd Edition. New York: Wiley. 0764549863

Contributions to Grade

The coursework consists of: 1) participation, 2) a series of lab exercises, and 3) a project. The grade is based on the following distribution:

- Participation (10%): including regularly logging into class webct each week, participating in class discussions, and completing lab exercises on time, etc.
- Lab exercises (5 x 6% = 30%)
- Open book quizzes (5 x 5% = 25%)
- Project (35%):

- Content modeling and presentation (15%):
 - Analysis and critique of the current content structure at a Web site of your choice
 - Recommendations for content management improvement
 - DTD or schema design
- Implementation of the reengineered design (15%):
 - Populating data into XML instance documents
 - Creating XSL programs for transforming XML documents into browser display
- Lessons learned (5%):
 - Any comments and thoughts on the design and implementation process
 - If you could do the same project again, would you do it differently?

Expectations and Grading Policy

I try to make every class worth attending. Students will be responsible for any and all material covered, handed-out, announced, etc. in class unless told otherwise.

If you have any type of disability which may require additional time or special consideration, please let me know at the beginning of the course.

Grading Policy

1. According to the grading policy of the School of Information Studies, a "basic grade" (**B**) will be awarded for student performance that is judged to be satisfactory for the course level. A satisfactory level of work is the one that meets minimum requirements as described in the coursework specification. All other grades will be determined in comparison with the standards of the basic grade.
2. Fulfilling the requirements for an assignment coupled with the absence of errors (in writing, arithmetic, formatting) will earn a grade no higher than **B+**. To earn an **A-** or **A** grade, the assignment must go beyond the minimum expected in terms of quality (insight, creativity, analysis, thoroughness, synthesis).
3. Grade levels follow the scales below:
A = 94-100, A- = 90-93, B+ = 85-89, B = 80-84, B- = 75-79, C+ = 70-74, C = 65-69, F = 64 and below
4. An incomplete grade, **I**, can be given only if the circumstances preventing the on-time completion of all course requirements were clearly unforeseeable and uncontrollable. If an incomplete is required a written contract must be completed which specifies the nature of the missing work, the date it will be completed, and the default grade that will be given if that deadline is missed.
5. It is unethical to allow some students additional opportunities, such as extra credit assignments, without allowing the same options to all students.
6. Failure to complete any course requirement will result in a course grade of **C** or lower, regardless of the grades received in other components.
7. To discuss a grade, arrange for a private meeting in which you identify the sources of your concern. It is important to bring with you to that meeting the relevant materials (e.g., marked papers). For final grades, no appeal will be considered after 12/20/2008.
8. Attendance in all class sessions (and throughout each session) is expected, exactly as it would be on the job. If an emergency or illness occurs, have someone notify your team and the course instructor as soon as possible--even if you are out of town. If you are going to be absent from class or from team meetings you need to make arrangements to catch-up on what you missed and to make sure your part of the workload is covered. Too many absences are sufficient cause to lower the final course grade. Exceptions will be made for emergencies and other extenuating circumstances provided they are verified by appropriate documentation that is received no later than 1 week after the absence(s).

Academic Honesty

Syracuse University and School of Information Studies policies on academic honesty will be adhered to strictly. Students enrolled in IST courses are required to follow the guidelines for academic honesty described in the School of Information Studies Statement on Academic Integrity, available in any IST Student Handbook, on the Web at <http://istweb.syr.edu/design/academic/courses/administrative/integrity.html> or on request at the IST Student Services Office in Hinds Hall.

Schedule

| Week | Topics | Readings | Activities and dues |
|-------|---|---|---|
| 8/24 | Introduction to the course <ul style="list-style-type: none"> ▪ What is XML ▪ Why we should learn about it • Course structure • Requirements for coursework | Coles - Chapter 1 Harold - Chapters 1-2. | |
| 8/31 | Introduction to web content management | Qin, Web Content Management | Discussion Tutorial: getting familiar with SQL Server 2008 and XML Spy |
| 9/7 | XML basics <ul style="list-style-type: none"> • Syntax and structure • Main components • Well-formedness | Coles – Chapter 3 Harold - Chapters 3, 6 | Tutorial: create your first XML documents Due 9/14: Exercise 1 |
| 9/14 | Content modeling <ul style="list-style-type: none"> • Entity-relationship modeling • Object-oriented modeling • Design of XML documents • Design of Document Type Definitions (DTDs) | Coles – Chapter 4 Harold - Chapters 4-5 | Tutorial: creating a simple DTD Quiz 1 |
| 9/21 | Interoperability between XML and relational data DTD attributes and entities <ul style="list-style-type: none"> • Attribute types and uses • Entity types and uses • Design issues regarding attributes and entities | Coles – Chapter 2 Harold - Chapters 8-10 | Tutorial: 1) creating a DTD with more complex content model and use of entities, and 2) convert the DTD into an XML schema Due 9/28: Exercise 2 |
| 9/28 | XML schemas (1) <ul style="list-style-type: none"> ▪ Namespaces ▪ Data types ▪ Using schemas • DTD vs. Schema | Coles – Chapter 4 Harold - Chapters 11, 20 | Tutorial: creating a schema and enter two sample records Quiz 2 |
| 10/5 | XML schemas (2) <ul style="list-style-type: none"> • Complex type • Groups • Referential relationships • User defined data types • | Coles – Chapter 4 Harold - Chapter 20 | Case study: building a schema for a product catalog and developing a domain vocabulary. Bring the lab result to classroom for discussion. Due 10/12: Exercise 3 |
| 10/12 | Navigation within and between XML documents, retrieve XML data: <ul style="list-style-type: none"> • XPath, XLink, XPointer • XQuery XML rendition. <ul style="list-style-type: none"> • Cascading Style Sheets for rendering XML content • XML stylesheets for rendering XML content | Coles – Chapter 5 Harold - Chapters 17, 18 | Tutorial: designing a CSS for displaying the XML content in browser Quiz 3 |
| 10/19 | XSL Transformation: Part I. <ul style="list-style-type: none"> • Template rules • Tables • Dealing with recurring instances | Harold - Chapters 13-14 | Tutorial: creating a simple XSL program Due 10/26: Exercise 4 |

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| 10/26 | XSL Transformation: Part II. <ul style="list-style-type: none"> • Calling template rules • Selective rendering of content • Images and links | Harold - Chapter 15 | Tutorial: 1) creating an XSLT program with more functions Quiz 4 |
| 11/2 | XSL Transformation: Part III. <ul style="list-style-type: none"> • Using variables • XSLT programming style • XSL Formatting Objects | Coles – Chapter 8 Harold - Chapter 15 | Due 11/9: Project description |
| 11/9 | XML and Database <ul style="list-style-type: none"> • Storing XML in a relational DBMS • XML, SQL, XPath, and XQuery | | Tutorial: working with XML and SQL server Due 11/16: Exercise 5 |
| 11/16 | Creating an XML-based information system: case studies Wrap-up: <ul style="list-style-type: none"> • Schema programming • Content and data models • Programming in XSLT • Integrating XML with other technologies | Harold - Chapter 25 | Discussion |
| 11/23 | • Thanksgiving holiday. No class. | | |
| 11/30 | XML project show & tell | | Due 11/30: Complete term project |

Exercises

NOTE:

- 1) All excises are due by midnight on Sundays
- 2) All files for the same exercise should be uploaded to WebCT. No paper submission for all exercises.

Exercise 1—Creating XML documents (due: 9/14)

Purpose:

- 1) To become familiar with the syntax of XML,
- 2) To become familiar with the software.

Exercise 2—Creating DTDs (due: 9/28)

Purpose:

- 1) To provide hands-on experience in creating a DTD, and
- 2) To understand the idea of content model.

Exercise 3—Creating an XML schema (due: 10/12)

Purpose:

- 1) To understand the syntax and data types in XML schema, and
- 2) To gain experience in creating reusable schema components and content structures.

Exercise 4—Creating XSL programs to display XML in a browser (due: 10/26)

Purpose:

- 1) To learn basic XSL, and
- 2) To gain hands-on experience in writing XSL programs for rendering XML documents.

Exercise 5 -- XSLT programming (due: 11/16)

Purpose:

- 1) To understand the basic elements in XSLT, and
- 2) To gain experience in writing XSLT programs.

Term Project (Due: 11/30)

You need to choose a case from your work or a website that needs reengineering for content management. *No fictitious Web site* should be used as the project topic. The case profile is due on the date indicated in the schedule. For components in your case profile, please refer to the first item listed in the Requirements below.

You are strongly recommended to work with at most two other people in the class on the term project. An evaluation form will be provided for each member to evaluate other members' contribution to the project (e.g., % of effort). Grade will be assigned based on such statements and the quality of the project.

The term project must be submitted in the form of a Web page with links to all components. Diagrams can be created by using PowerPoint and then make a screenshot, so that you can put it as an image file on your Web page. The final project should be uploaded to your student file space on the course Web site, and you are responsible for making every file and image display properly and every link work.

Purpose:

- 1) To gain experience in conceptual analysis and modeling for Website content design through a case study, and
- 2) To enhance practical skills in implementing the conceptual design into DTDs, XML documents, and XML stylesheets for transformation.

Requirements:

1) *Case profile* (length: one or two screens): the profile should include the following items:

- o Location(s) (virtual and/or physical), Web site content types and volume, update frequency, current methods for content management (database-driven or flat HTML file system), users (customers, employees, businesses, etc.).
- o Evaluation of the current content management: organization of information on products, services, white documents, company news, annual reports, etc. Focus on whether or not the content is organized into a coherent whole, whether or not labels/names of information categories are clear and easy to understand, how data/text is presented (classified or other methods), how the documents are structured, if any, the site content structure and its layers of file directory system (this can be found by looking at the file paths in the URLs).
- o Based on your case analysis, make recommendations for reengineering the content management.

2) *Implementation*: The implementation should reflect your recommendations for reengineering the content structure and management. This component should include:

- o A diagram of the content structure: document types, departments, and their relations. Indicate where XML DTDs need to be deployed;
- o At least 5 different XML DTDs/schemas (you may recommend as many as your case needs, but you don't have to implement them all in this project).
- o Create one XML document for each of the DTDs (e.g., you may have 5 XML documents in total, but each XML document should contain at least 5 instances/records). You may use your favorite XML editor/generator to create the documents.
- o Create one stylesheet (XSL) for each of the XML documents.

What to hand in (all files must be uploaded in the same directory):

- 1) Case analysis and recommendations
- 2) Implementation architecture (a diagram showing relationships between each DTD/schema, if any, and functions)
- 3) All required XML, DTD/schema, XSL files,
- 4) Any additional documents or images

Grading Criteria:

Case analysis: thoroughness, depth, and logicalness.

Implementation: Creative use of elements, attributes, entities, and other components of XML documents, and logical organization and arrangement of these components; creative use of XSLT programs in rendering the content in browsers; and application of XML schema design techniques and XSL functions.

In either case, correct spelling and clearness in format and expression are expected. The level of complexity of the project also contributes to the overall evaluation.