**CPET 499/ITC 250 Web Systems**

**Dec. 12, 2013**

**Review of Courses**

**Final Exam 2013/12/19 Friday, 10:30 AM-12:30 PM**

\*\* **Final Exam** (Comprehensive, All in-class, covering class lectures, reading and homework assignments; No Online Exam given - Thursday, December 19, 10:30AM-12:30PM, Room ET 346)
\*\*\* Final Exam Part 1 (closed books/notes): 10:30AM - 11:30 AM, Multiple-choice questions
\*\*\* Final Exam Part 2 (Open books/notes, no computer usage): 11:30 AM-12:30 PM, Q/As, and Programing Problems

**First Meeting of the Class, 8/27/2013**

**Last meeting of the Class, 12/12/2013**

**Systems**

* Hardware systems vs. Software System
	+ Computer systems
	+ Network systems
	+ Communication systems
* Web systems
	+ Computers
		- Web servers
		- Web clients
	+ Software
		- Authoring tools
		- Browsers
		- Servers
	+ Communication/Networking
	+ Protocols
	+ Information/Data
	+ Audio/Video
* Industries/Business
	+ E-learning
	+ Advertisement
	+ Books/Publishing
	+ E-Commerce/Business
	+ Collaboration Tools
	+ Control/Monitoring Tools
	+ Entertainment
	+ Audio/Video
	+ IT Services
	+ Automation
		- Office
		- Financial Systems
		- Stock markets
		- Energy Market
		- Factory
	+ Mobile computing
	+ Healthcare IT
	+ SmartGrid – Power & Energy System, Renewable energy resources (solar, wind, biomass, etc)
	+ Cloud Computing
		- Software as a Service (SaaS)
		- Platform as a Service (PaaS)
		- Infrastructure as a Service (IaaS)

**SUMMARY – Coverage on HTML Topics**

* **Chapter 2. Introduction to HTML (Part 1)**
* **Chapter 3. Introduction to HTML (Part 2)**
* **E-book: Building Web Applications with HTML, by Paul Lin**
	+ **Chapter 1: Programming Languages for Web Applications**
	+ **Chapter 3. Hypertext Markup Language Basics**
* **Lecture on Web System Infrastructure and Protocols (PPT file)**
* **Chapter 5. Cascading Style Sheet (CSS) Part 1**
* **Related Demos, Homework Assignments**

**SUMMARY – JavaScript, Program Design Tool, Server Side Scripting Topics**

* **Chapter 6. JavaScript: Introduction to Scripting**
* **Chapter 7. JavaScript: Control Statements I**
* **Chapter 8. JavaScript: Control Statements II**
* **E-book: Developing Advanced Web Applications Using JavaScript, by Paul Lin**
* **Chapter 17. Web Servers: Introduction to Web Servers (pp. 606-614), XAMPP Server Installation: Apache, MySql, Perl, etc**
* **Chapter 9. JavaScript: Functions**
* **Chapter 10. JavaScript: Arrays**
* **Chapter 11. JavaScript: Objects**
* **Chapter 12. Document Object Model (DOM): Objects and Colelctions**
* **Lecture on Web System Infrastructure and Protocols (PPT file)**
* **Unified Programming Language – UML (11/12):**
* **E-Book: Programming with Perl/CGI, by Paul Lin**
	+ **Web Servers and CGI/Perl Programming**
	+ **Per Programming Environment**
	+ **CGI Environmental Variables**
	+ **Processing and Analyzing Data**
* **Chapter 13. JavaScript Event Handling**
* **Related Demos, Readings and Homework Assignments**

**SUMMARY – XML , AjAX, Web Servers, Database**

* **Chapter 15. XML (eXtensible Markup Language)**
* **E-Book: XML and Enterprise Application Integration**
* **Chapter 16. AJAX – Enable Rich Internet Applications with XML and JSON**
* **Chapter 17. Web Servers (Apache)**
* **Chapter 18. Database: SQL**
* **Related Demos, Readings and Homework Assignments**

**Chapter 1 Introduction to Computers and the Internet**

* The Internet in Industry & Research
	+ E-Commerce & Business
	+ Mobile Computing and SmartPhone
	+ Electronic Health Record
	+ Cloud Computing
	+ SmartGrid
	+ Email, Instant Messaging, Video Chat, etc
* Evolution of the Internet & WWW
	+ ARPANET
	+ Packet switching
	+ TCP/IP
	+ World Wide Web, HTML, HTTP, HTTPs
* Web Basics
	+ Hyperlinks
	+ URIs, URLs, URNs
	+ Web servers and clients
	+ Making a Request and Receiving a Response
		- Get /books/downloads.html HTTP/1.1
		- Status of the transactions
			* HTTP/1.1 200 OK
			* HTTP/1.1 404 Not found
			* [www.w3.org/Protocols.rfc2616/rfc2616-sec10.html](http://www.w3.org/Protocols.rfc2616/rfc2616-sec10.html)
	+ HTTP Headers
		- Content-type” text/html
		- MIME type (Multipurpose Internet Mail Extensions)
			* Image/jpeg
	+ HTTP get and post Requests
		- Get (Client <= Server)
		- Post (Client => Server)
* Muiritier Application Architecture
	+ Three-Tier Architecture
		- Client Tier (Browser) ⬄ Business Logic Tier (Web Server) ⬄ Data tier (Databases)
* Client-Side Scripting versus Server-side Scripting
* World Wide Web Consortium (W3C)
* Web 2.0, Search Engine, Social Media, Web Services, AJAX
* Social Applications
	+ Facebook
	+ Twitter
	+ Groupon
	+ Foursquare
	+ Skepe
	+ YouTube
* Data Hierarchy
* Operating Systems
* Mobile Operating Systems
* Types of Programming Languages
* Object Technology

**Chapter 2 Introduction to HTML 5 (Part 1)**

* Components of HTML5
* Tools for creating HTML5 documents
* Add images
* Create and use hyperlinks
* Create tables
* Create and use forms to get user input

**Chapter 3 Introduction to HTML 5 (Parts1)**

* New input types
	+ Input type **color**
	+ Input Type **date**
	+ Input Type **datetime**
	+ Input Type **datetime-local**
	+ Input Type **email**
	+ Input Type **month**
	+ Input Type **number**
	+ Input Type **range**
	+ Input Type **tel** (Telephone)
	+ Input Type **tim**e
	+ Input Type **url**
	+ Input Type **week**

**Chapter 4 Introduction to Cascading Style Sheets (CSS): Part 1**

* Purposes
	+ Control a website’s appearance
	+ Use style sheets to separate presentation from content
	+ Use a style sheet to give all the pages of a website the same look and feel
	+ Class attribute
	+ Specify the Font, Size, Color, and other properties of displayed text
	+ Specify element backgrounds and colors
* Types of Style Sheets
	+ Inline Styles
	+ Embedded Style Sheets
	+ External Styles Sheets & Methods of Linking

**SUMMARY – Coverage on JavaScript, Program Design Tool, Server Side Scripting**

**Topics**

* **Chapter 6. JavaScript: Introduction to Scripting**
* **Chapter 7. JavaScript: Control Statements I**
* **Chapter 8. JavaScript: Control Statements II**
* **E-book: Developing Advanced Web Applications Using JavaScript, by Paul Lin**
* **Chapter 17. Web Servers: Introduction to Web Servers (pp. 606-614), XAMPP Server Installation: Apache, MySql, Perl, etc**
* **Chapter 9. JavaScript: Functions**
* **Chapter 10. JavaScript: Arrays**
* **Chapter 11. JavaScript: Objects**
* **Chapter 12. Document Object Model (DOM): Objects and Colelctions**
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	+ **Web Servers and CGI/Perl Programming**
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	+ **CGI Environmental Variables**
	+ **Processing and Analyzing Data**
* **Chapter 13. JavaScript Event Handling**
* **Related Demos, Readings and Homework Assignments**

**Chapter 6 JavaScript: Introduction to Scripting**

**<!DOCTYPE html>**

**<html>**

**<head>**

**<meta charset =”utf-8”>**

**<title>**

**<script type = “text/javascript”>**

**…**

**…**

**…**

 **</script>**

**</head>**

**<body>**

**…**

**</body>**

**</html>**

* Document object
	+ Methods
		- document.writeln()
		- document.write()
* Window object
	+ Methods
		- document.writeln()
		- window.alert(), with OK button
		- window.prompt(), Prompt, Get user input, OK & Cancel buttons
* Other System wide methods
	+ parseInt()
* Javascript programming
	+ Arithmetic Operators
		- +, -, \*, /, %
	+ Decision Making and Related Operators
		- >, <, >= <=, ==, !=
		- If, else
	+ Adding integers example
		- Variables
		- Operators

**Chapter 7 JavaScript: Control Statements I**

* <script type = “text/javascript”> …. </script>
* JavaScript Keywords (commonly used)
	+ var
	+ if, else, true, false
	+ for, do, while
	+ switch, case, break, continue, default
* Conditional Operator
	+ (? : )
* Assignment Operators
	+ +=, -=, \*=, /=, %=
* Increment and Decrement Operators
	+ ++ (++a, Pre-increment); (a++, Post-increment)
	+ – (--a, Pre-decrement); (a--, Post-decrement)
* Nested if, else
* Repetition Statements
	+ while

**Chapter 8 JavaScript: Control Statements II**

* Counter-Controlled Repetition
	+ while Loop
	+ for loop
* do-while Repetition
* Switch Multiple-Selection
	+ switch()
		- case
		- break
		- default
* continue, break
* Logical Operators
	+ && (AND), || (OR), ! (NOT)
	+ >, >=, <, <=
	+ ==, !=
* Conditional Operator
	+ ?:

**Chapter 9 JavaScript: Functions**

* Program Modules
* Function Definitions
* User Defined Function
	+ Scope Rules
		- Global variables (script-level)
		- Local variables (function-level)
* JavaScript System Support Objects/Functions

**Chapter 10 JavaScript: Arrays**

* Arrays
	+ Declaring and Allocating Array Objects
		- var c = new Array(100);
	+ Zeroth element
	+ length property
* Passing Arrays to Functions
* Sorting Arrays
* Searching Arrays
* Multi-Dimensional Arrays

**Chapter 11 JavaScript: Objects**

* Math Objects
	+ Methods
		- Math.sqrt(), Math.pow(), Math.exp(), Mth.log()
		- Math.abs(), Math.min(), Math.max(), Math.round(), Math.ceil()
		- Math.cos(), Math.sin(), Math.tan()
	+ Properties
		- Math.E, MART.SQRT2, Math.LN2, Math.LN10, etc
* String Object
	+ charAt()
	+ concat()
	+ split()
	+ substring()
	+ toLowerCase(), toUpperCase()
	+ etc
* Date Object
	+ getDate()
	+ getDay()
	+ getFullYear()
	+ getHours()
	+ getMinutes()
	+ getMonth()
	+ getSeconds()
	+ getTime()
	+ etc
* Boolean and Number Objects
	+ toString(radix)
	+ valueOf()
	+ etc
* Document Object
	+ getElementByID(id)
	+ getElementByTagName(tagName)
* localStorage and sessionStorage

**Chapter 12 Document Object Model (DOM): Objects and Collection**

* DOM Nodes and Trees
* DOM Collections
	+ images collection
	+ link collection
	+ forms collection
	+ anchors collection
* Dynamic Styles and Animated Effects
	+ window.seInterval()
	+ window.clearInterval()

**Chapter 13 JavaScript Event Handling**

* load event
	+ onload
* mousemove event
	+ mouseover
	+ mouseout
* Form processing with focus and blur events

**Chapter 15 XML**

* XML Basic
	+ Elements
	+ Vocabularies
	+ Viewing and Modifying XML Documents
	+ Processing XML documents
	+ Validating XML documents
* Structuring Data
	+ XML declaration
	+ Root nodes and XML prolog
	+ XML Element Names
	+ Viewing an XML Document in a Web Browser
* Application Examples
	+ A Business Letter
	+ XML document
	+ DTD(Data Type Definition) file
* XML Namespaces
	+ xmlns attribute
	+ unique URIs
	+ Namespace Prefix
	+ Namespaces in CML vocabularies
* Data Type Definition (DTD)
	+ !Element
	+ !ATTLIST
	+ CDATA, #PCDATA
	+ #REQUIRED, #IMPLIED, #FIXED, EMPTY
* W3C XML Schema Documents
	+ Defining an element in XML schema
		- string, Boolean, decimal, float, double, long, int, short, date, time, …
* MathML

**Chapter 16 Ajax-Enables Rich Internet Applications with XML and JSON**

* Ajax Application vs Traditional Web Application
	+ Asynchronous
	+ Callback function
* AJAX Technologies
	+ HTML
	+ JavaScript
	+ CSS
	+ DOM
	+ XML
* XMLHttpRequest object
	+ Asynchronous Requests
		- addEventListner()
		- open()
		- send()
		- setRequestHeader()
		- getResponseHeader()
		- getAllResponseHeaders()
		- abort()
	+ Properties
		- Readystatechange
		- readyState
		- resnoseText
		- responseXML
		- status
		- statusText
* Exception Handling
	+ try
	+ catch

**Chapter 18 Database: SQL, MySQL, LINQ and Java DB**

* Relational Datbases
* Tables
	+ Rows, columns
	+ Primary key
	+ Foreign keys
* A Books Database Example
	+ Author table
	+ AuthorISBN table
	+ Titles table
* Entity-Relationship (ER) Diagram
	+ One-to-many
	+ Many-to-one
	+ Many-to-Many
* SQL keywords
	+ SELECT, FROM, WHERE, GROUP BY, ORDER BY, INNER JOIN, INSERT, UPDATE, DELETE
* SQL Examples