

COURSE DESCRIPTION

Dept., Number	CSC 121	Course Title	Client-Side Web Programming
Semester hours	3	Course Coordinator	Kwai-Ting Lan
		URL (if any):	http://gaia.ecs.csus.edu/~lan/

Catalog Description

Client-side Web programming using JavaScript, DHTML, and client-side Web technologies. Event-driven programming, dynamic data types, control structures, and introduction to object-oriented programming and program design. Use of cookies and built-in objects. Validation and processing of forms. Basic features of the Document Object Model. Prerequisites for non-majors: At least a C- grade in both CSC 22 and CSC 80, or equivalents. Prerequisites for majors: At least a C- grade in both CSC 60 and CSC 130.

Textbook

Deitel & Associates, Internet & World Wide Web: How To Program, 4th Edition, Prentice-Hall, 2007.

References

Various public websites and online resources.

Course Goals

Study various aspects of client-side web programming and website design that include:

1. Fundamentals of client-side web programming.
2. Basic concepts of dynamic HTML (DHTML).
3. Understanding of number systems, data types, control structures, and procedural abstraction.
4. Basic concepts of event-driven programming.
5. Fundamentals of browser objects, Javascript objects and Document Object Model (DOM) objects.
6. Client-side form validation and regular expression.
7. Creating web pages with standard script programming language and DHTML.
8. Designing, implementing, testing, and documenting computer programs using an object-oriented approach, modularity, and stepwise refinement.
9. Introduction to data abstraction through the development and use of classes.
10. Basic concepts of dynamic data type.
11. Teamwork experience on website design projects.

Prerequisites by Topic

Thorough understanding of:

- Any structured programming language including its control structures, expressions, statements and subroutines.
- HTML and XHTML.
- Web color and hexadecimal notation.
- Hyperlinks and anchors.
- Cascading Style Sheets (CSS).
- Lists, tables, frames and forms.
- Images, animated images and image maps.
- Multimedia, sound and video files.
- HTML editors and tools.
- Webpage design and layout.
- Website and site map design.
- Testing and debugging web pages.

Basic understanding of:

- Webpage design trends.
- Web protocols: FTP, HTTP, TCP/IP and URL.
- Web client and server software.
- ASCII code and Unicode.

Major Topics Covered in the Course

1. Course overview and introduction (1 hour).
2. Using classes/objects, including class libraries (2 hours).
3. Designing and developing classes/objects, data abstraction (3 hours).
4. Designing, developing, and documenting programs using classes/objects (2 hours).
5. Algorithm development, detailed design (3 hours).
6. Program testing and debugging (1 hour).
7. Javascript compiling, executing, interpreting; and virtual machine (1 hour).
8. Basic data types, dynamic data types, dynamic array and objects (3 hour).
9. Strings and string manipulation (2 hour).
10. Interactive input/output (2 hour).
11. Operators, expressions, assignments (1 hour).
12. Boolean expressions, conditional statements (2 hours).
13. Iteration and recursion (2 hours).
14. Scope of identifiers, lifetime of variables (1 hour).
15. Procedural abstraction, methods (functions), stepwise refinement, parameters (2 hours).
16. Use of sorting and searching algorithms (2 hours).
17. Document Object Model (2 hours).
18. DHTML and event-driven programming (5 hours).
19. Use regular expressions (2 hours).

20. Creating and applying events to form objects and form validation (3 hours).
21. Cookies and Web project design discussion (1 hour).
22. Website project demo and presentation (2 hours).

Outcomes

Thorough understanding of:

- Javascript programming language and DHTML.
- Event-driven programming.
- Form validation.
- Web animation with Javascript and DHTML.
- Web browser objects, Javascript objects and DOM objects.
- Design and implementation of websites using Javascript and DHTML.
- Fundamental syntax of the programming language used in the course.
- Concepts of data types and dynamic data types.
- Dynamic arrays of objects.
- Concepts of assignment; arithmetic, relational, and Boolean expressions.
- Parameter passing and its implications.
- Number system conversions and Unicode (bases 10, 16).
- Debugging techniques, including the use of a symbolic debugger.

Basic understanding of:

- Use of classes/objects/methods to solve problems.
- Design and implementation of classes.
- Program development process.
- Stepwise refinement and modularity.
- Regular expression
- DOM.
- Recursion.
- Scope rules.
- Strings.
- Interactive text I/O.
- Standard algorithms such as: sequential search, simple sorts.

Exposure to:

- Program testing techniques.
- Concept of a virtual machine.
- XML.
- Flash.
- ASP.NET.

Laboratory Projects

1. Scientific calculator webpage design and implementation.
2. Photo album and slide show website design and implementation.
3. Digital alarm clock, including time and date information.
4. Tic-Tac-Toe: Two-Player strategy Web game design and implementation.
5. Magic square.
6. Form design, validation, and implementation.
7. Web animation: Short movie design and implementation.
8. Design and implement a professional quality website and make an oral presentation to the class.

Estimated Curriculum Category Content (Semester hours)

<i>Area</i>	<i>Core</i>	<i>Advanced</i>	<i>Area</i>	<i>Core</i>	<i>Advanced</i>
Algorithms			Data Structures		
Software Design			Prog. Languages		
Comp. Arch.					

Oral and Written Communications

Every student is required to design a professional quality website and to make an oral presentation to the class.

Social and Ethical Issues

Copyright and legal issues of intellectual property, web software, and web documents.

Theoretical Content

No significant component.

Problem Analysis

Projects require students to design and analyze various alternatives to make usability and performance choices.

Solution Design

Projects require students to design and analyze various alternatives to make usability and performance choices.