

### **Current Description**

The Internet has revolutionized modern life, including the way people shop, communicate, and even where and how they work. At the forefront of this revolution are the people writing the software that drives the World Wide Web. The goal of this course is to provide the student with key skills demanded in the fast-paced and exciting field of web development. The course will begin with an in-depth study of HTML, the universal language of the Web. This will be supplemented by coverage of XHTML and XML, the next-generation languages of the Web. CSS will be studied as it relates to enhancing the presentation of websites. Client-side programming will be taught using JavaScript and DHTML, languages used to create dynamic content and provide a true interactive experience for the Web site visitor. Throughout the course, emphasis will be placed on the development of professional, cross-browser websites.

### **Proposed Description**

The Internet has revolutionized modern life, including the way people learn, communicate, shop, and even where and how they work. At the forefront of this revolution are the people writing the software that drives the World Wide Web. The goal of this course is to provide the student with key skills demanded in the fast-paced and exciting field of web programming.

The course uses the HTML5 set of technologies – HTML, CSS, JavaScript, and the Document Object Model – to introduce students to web programming. The focus will be on web browser client programming, where students will learn foundation concepts and techniques that will be built upon in future courses. Throughout the course, emphasis will be placed on the development of professional-quality web content.

## Proposed topic sequencing (grouped in topic clusters)

Course introduction

Relevant internet and web history, of interest to a first-year programming student (i.e. the Web is an application which runs on the Internet)

How the web works (request, reply, HTTP protocol intro; role of a web server, role of browser client)

Anatomy of a request for a “page” – how a server processes a request; how a browser renders a response

Web programming requires competence in HTML5 (this course), and selected web app server platforms (future)

HTML5 includes HTML markup, CSS, JavaScript, and the Document Object Model (DOM) (then explain each; specific versions)

Markup language programming – HTML markup, and CSS (the DOM provides structure) (requires a host, such as a browser, which provides a content rendering environment)

Structured (object-oriented) programming – JavaScript (the DOM provides structure) (requires a host, such as a browser, which provides a runtime execution environment)

Topic – the concept of document structure / structure of a document

Get started with the HTML markup language

Important elements – html, head, body

The role of the head element in a document

Element rendering – block mode, inline mode

Important elements – h1, h2 (etc.), p, div, span, ol, ul, li

Important elements – a, img

Get started with the DOM

Topic – DOM and the browser (diagram), and DOM and HTML (diagram)

Definition of a web site (and a web app is a web site that’s hosted on a publicly-available server)

Kinds of objects (pages, documents, media, and other code resources) that can be on a web site

Organizing a web site’s objects (using folders, naming conventions, and so on)

Developer tools (editors, browsers, inspectors, etc.)

Developer support tools (file managers, imaging tools, etc.)

Your development environment (client, server, etc.)

Getting started with CSS

Introduction to document appearance formatting with CSS (by accessing the DOM)

Important selectors and rulesets for the new web programmer

Selectors and rules (thorough coverage)

Where to put CSS (inline, internal, external)

Organizing CSS (suggestion: into four categories – normalization, layout, typography, graphics/media)

Topic – the box model

Positioning and layout with CSS (big topic)

Writing your HTML markup to be usable by CSS (and JavaScript); in other words, use DOM features

Appropriate introduction to page/document design concepts for the web programming student

The role of tables to present tabular data

Thorough (appropriate) coverage of HTML table

Multi-column layouts, grid systems, etc.

Page/document templates – their usefulness, designing them, using them, etc.

Navigation techniques (tab/panels, menu systems, and so on)

Topic – web standards, browsers, normalizing via CSS (and... the role of libraries like jQuery)

Awareness of preparing content for mobile devices

Image handling, standards, and best practices

Video handling, standards, and best practices

Audio handling, standards, and best practices

Maybe... brief introduction to dynamic rendering of 2D graphics, with HTML5 canvas

Compatibility and graceful degradation (e.g. H.264 > Flash > image/photo > text)

Getting started with JavaScript

Major goal – programmatic access to the DOM (and to web services)

Event handling with JavaScript

Document modification with JavaScript

Where to put JavaScript (inline, internal, external)

Thorough coverage of the language, by focusing on event handling and document modification

Maybe... an introduction to jQuery, and discussion of the problems that it (and others like it) solves

Getting started with a web server-based app

Introduction to HTML forms and server web app processing (from a requestor's point of view)

Introduction to the (professor-written, or publicly-available) web apps and web services that you will use in this course

Important elements – form, input (all implementations), select

Input data validation, using HTML elements and JavaScript

Introduction to web services (from a requestor's point of view)

An introduction to Ajax

Working with a web service using XMLHttpRequest

An introduction to web service message formats, JSON and XML

Maybe... how jQuery (and others like it) helps with Ajax

Security considerations and awareness

Preview of future coverage

Continuing themes – doing more with the DOM, CSS, JavaScript (and maybe something like jQuery)

Programming web apps on the LAMP stack (with PHP)

Programming web apps on the Microsoft Web Platform (with ASP.NET Web Forms)

Programming web services