Suggested Teaching Guidelines for
Advanced Web Programming–PG-DAC February 2019

Duration: 26 class room hours + 24 lab hours (**50hrs**)

Objective: To introduce the students the HTML, JavaScript, PHP, XML, JSON, Ajax & Drupal and practical relevance of all these technologies.

Prerequisites: Knowledge of Internet

Evaluation method: Theory exam– 40% weightage
Lab exam – 40% weightage
Internal exam–20% weightage

List of books / other training Material:
Text Book:
1. HTML5 covers CSS3, Javascript, XML, XHTML, Ajax, PHP and jQuery - Black Book/Dreamtech Press

Reference:
1. Internet & World Wide Web How to Program by Deitel, Deitel & Nieto; Pearson Education
2. XML - How to Program - Deitel and Deitel - Prentice Hall
3. Ajax In Action by Dave Crane, Eric Pascarello, Dreamtech Press
4. Web Application Security: A Beginner\'s Guide, Bryan Sullivan, TMH
5. Joomla: 24-Hour Trainer (With CD)by Jen Kramer/ Wiley India Pvt Ltd (2011)
6. Node.js, MongoDB and AngularJS Web Development by Dayley Brad Dayley / Pearson
7. Pro AngularJS by Klaus Freeman Adam Freeman Freeman / Apress
8. AngularJS Services by Paperback / Shroff Publishers & Distributors
9. Angularjs in Action by Lukas Ruebbelke / Dreamtech Press
10. JavaScript: The Good Parts 1st Edition by Douglas Crockford / O'Reilly
11. JavaScript Step by Step 2nd Edition by Steve Suehring/PHI Learning
12. HTML5, JavaScript and jQuery by Dane Cameron/Wiley India
13. Sams Teach Yourself JavaScript in 24 Hours (English) 1st Edition Phil Ballard, Michael Moncur/Pearson Education
14. High Performance JavaScript 1st Edition by ZAKAS / O'Reilly

Session 1: Architecture of Web
- Brief history of the Internet
- How the internet works?
- Internet protocol; HTTP protocol; Domain names; Domain Names Service Servers
- HTTP Protocols
  - Difference HTTP1.0 , HTTP 1.1 & HTTP 2.0 and ES7 standard
  - Stateless nature of the protocol
  - Methods (GET, POST, HEAD, PUT, DELETE
  - HTTP session
  - Status codes
  - Persistent connections
  - HTTPS
- Architecture of the Web

- Web servers; IIS; Apache server

Assignment Lab:
- Exploring different Browser Plugins
  - Firefox: Firebug, Web Developer Toolbar
  - Chrome: Developer Tools (no plugin necessary)
  - Safari: Web Inspector (no plugin necessary)
- Exploring different Text Editor
  - Windows: Notepad++
  - Linux: Gedit + Plugins
- Exploring about FTP
  - FileZilla
  - Another option: SSH

Session 2 : HTML
- Introduction to HTML5
- Basic HTML
- Introduction to basic HTML Aligning the Headings
  - Anchor Tag
  - Paragraph
  - Images and Pictures
  - Tables
- Framesets
  - New features in HTML5
  - New element
  - New attribute
  - Link relations
  - Microdata
  - ARIA accessibility
  - Multimedia
  - 2D and 3D drawing Support
- HTML Forms
- HTML Controls
  - INPUT
  - Text Area
  - Radio Button
  - Check Box
  - Dropdown
  - List box
  - Submit button
  - Set button
  - Button
- List and Tables
- Document Object Model (DOM)
- Elements
- Events

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- HTML 5
  - Elements
  - Objects
  - Events
  - Canvas
  - HTML5 Validation
  - Audio & Video Support
  - Geo-location Support

Assignment – Lab:
- Create a webpage with HTML describing your department. Use paragraph and list tags. Apply various colors to suitably distinguish key words. Also apply font styling like italics, underline and two other fonts to words you find appropriate. Also use header tags. Create links on the words e.g. "Wi-Fi" and "LAN" to link them to Wikipedia pages. Insert an image and create a link such that clicking on image takes user to other page. Change the background color of the page. At the bottom create a link to take user to the top of the page.
- Create your bio-data in an HTML Page. Divide it into following sections – Personal information, Family Background, Academic Qualifications, and Experience. Now divide a HTML page into three frames as upper, left and right (main) frames. Write a Heading in the upper frame and put the bio-data sections links in the left frame and on click the section links the respective detail information should be displayed into the right main frame.
- Create a HTML Strict document. Use HTML comments, the title element, and meta elements to provide information about a document. Use headings, paragraphs, lists (definition, bullet, and numbered), blockquote, address, and preformatted block elements. Use line breaks, hypertext links, images, strong, emphasis, code, superscript, and subscript inline elements. Use id's and internal anchor links to jump within a page
  - For Lab, there are two members in a team, one team member (the driver) has control of the keyboard/mouse and actively implements the program
  - The other team member (the navigator) continuously observes the work of the driver to identify tactical defects (such as syntactic and spelling errors, etc.) and also thinks strategically about the direction of the work. Please check as follows for lab work:
    - Create a structured XHTML 1.0 Strict document with html, head, and body elements
    - Use HTML comments, title, and meta elements to a web document
    - Switch pair programming roles
    - Use headings to create a document outline
    - Switch pair programming roles
    - Format text with block tags
    - Format text with inline and anchor tags
    - Screen Snapshots

Session 3: Working with CSS
- Introduction to CSS
- Styling HTML with CSS
- Structuring pages with CSS
- Cascading style sheet
- Inline Styling (Inline CSS)

- External Styling (ExternalCSS)
- CSS Fonts
- The CSS Box Model
- The id Attribute
- The class Attribute
- HTML Style Tags
- Linking a style to an HTML document
- Internal style sheet
- Multiple styles

Assignment Lab:

- Considering the lab assignments of HTML
  - Write a CSS rule that changes the color of all the elements with attribute CLASS ="Green-Move" to green and shift them down 25 pixels and right 15 pixels.
  - Set the page body's margins to 10 pixels on all sides with no padding. Use a Verdana sans-serif font and set the default font-size to 95%
  - Set all divisions to display with a 1 pixel, solid, black border (to help with debugging)
  - In the Header Area
  - Set its heading 1's text to display centered, in a 'Courier New' monospace font, and a font size of .8 em
  - Set its heading 2's text to display centered with a font size of 1.5 em
  - In the Navigation Area
  - Make its width 25% of the screen size and float it left
  - Style its unordered list of anchor elements to look like a menu
  - Do not add the background image or onfocus attribute (final optional steps) in tutorial
  - use a background color of red and a text color of white
  - center the text
  - In the Main Content Area
  - Set the right and left margins to 26% of the screen size
  - Make its heading 2's text centered with a font size of 1.2 em
  - For Printing, write the style rules to
  - Set display to none for the navigation and advertisement areas so that only the header and main content are printed.
  - You do not need to specify style rules for the header and main content elements.
  - The browser should use the default settings when printing your Web page
- Create a form to submit a resume
- Using in line CSS. Write all the above styling in CSS in different file (.css) and link it to your webpage such that changes made in CSS file are immediately reflected on the page. Group paragraphs into single class and add styling information to the class in CSS. Add few form elements such as radio buttons, check boxes and password field. Add a submit button at last.
- Apply inline CSS to change colors of certain text portion, bold, underline and italics certain words in your HTML web page. Also change background color of each paragraph
- Create a simple form to submit user input like his name, age, address and favorite subject, movie and singer.

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Session 4: PHP
- Introduction to PHP
- Basic rule of PHP
- PHP in action
- Working with text, variable and numbers
- Making decisions and repeating yourself
- Arrays
  - Working with Arrays
  - Looping through array
  - Sorting arrays
- Functions

Assignment – Lab:
- Write a simple program in PHP.
- Write a program in PHP that uses the increment operator (++) and combined multiplication (*=) operator to print out the numbers from 1 to 5 and powers of 2 from 2(2^1) to 32(2^5)

Session 5: PHP
- Making web forms
  - Form processing with functions
  - Validating data
  - Display default value
- Working with cookies and Sessions
  - Login and User Identification
  - Parsing, display date and times

Assignment – Lab:
  - Write a simple program to remembering user with cookies and Sessions

Session 6: PHP
- Storing information with databases
  - Connection to database
  - Create a table
  - Inserting and retrieving data from database
  - Inserting and retrieving form data safely
  - MySQl with out PEAR DB
- XML
  - Generating and Parsing an XML Document
  - Advanced XML processing
- Debugging
  - Fixing parsing error and database error

Assignment – Lab:
  - Write a program to implement various databases queries.

Session 7: PHP
Lecture:
- Working with files
  - File permissions
  - Reading and writing files
  - Working with CSV Files
  - Checking for errors
- Command line PHP
- Running Shell command
- IMAP, POP3 and NNTP
- Graphics, PDF
- Sending and receiving mails

Assignment – Lab:
- Write a program to implement various file operation.
- Write a program to implement Command line PHP
- Write a program in PHP for Sending and receiving mails

Session 8: Working with XML
- Introduction to XML.
- Revision of HTML and Client-Server Architecture
- Reason for XML
- XML and the browser
- XML Validation
- XML as the mode of data transfer
- XML Parsers
- XML SAX Parser
- A basic XML Document
- Parts of the XML Document
- XML Schema
- Namespaces
- The Root Element
- Tags and Elements
- Attributes and Values
- CDATA and PCDATA
- XML Tree Structure
- XML style language

Assignment – Lab:
- Create some basic XML documents and check them out in the different browsers for validity.

Session 9: DTD
- XML DTD
- Creating Document Type Declarations.
- Creating Document Type Definition.
- Internal and External DTD's
- Associating DTD's with XML documents. (The XML Declaration and DOCTYPE declaration.)

- Validating documents against a DTD
- Internal and External General Entities.
- Element Type (ELEMENT) Declarations.
- Attribute (ATTLIST) Declarations.
- Using INCLUDE and IGNORE.

Assignment – Lab:
- Create a XML document and write DTD for it
- Create a XML document and validate it

Session 10: W3C DOM and XML DOM
- Introduction to DOM
- The DOM Document Object and its properties.
- Getting Elements by name
- Editing attributes and values.
- Handling Events on client side.
- XML and XSLT
- XML DOM parsers
- XML WSDL
- RSS Feed
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Assignment 1 – Lab:
- Create an HTM page with two frames using XML document
  - The top frame should have input text boxes for search criteria. The textboxes are: Marks greater than, Marks less than:
  - The lower frame will contain a grid, which will load the results of the above query.

Assignment 2 – Lab:
- Create an HTM page representing a departmental store bill:

  Header info: Name of customer

                 Date

                 Bill No.

                 Bill Details

  Consider a purchase of the following items:

Name	Qty	Rate	Amount
Apples	1	24	
Lux Soap	4	15	
Room freshner	1	200	

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Assignment 3 – Lab:

- Prepare a single XML representing the above data. Use data binding to display it. Calculate the total amount thru JavaScript and assign it to the total amount label at bottom.

Session 11 & 12: Working with JSON

- Introduction to the JavaScript Object Notation (JSON)
- Need of JSON
- JSON Syntax Rules
- JSON Data - a Name and a Value,
- JSON Objects,
- JSON Arrays,
- JSON Uses JavaScript Syntax,
- JSON Files
- JSON & Security Concerns, Cross Site Request Forgery (CSRF), Injection Attacks,
- JS XMLHttpRequest functions
- JavaScript XMLHttpRequest & Web APIs
- JSON & Client Side Frameworks
- JSON & Server Side Frameworks
- Replacing XML with JSON
- JSON parsing
- Introduction to Ajax
- Ajax Framework
- Ajax using HTML, CSS, JavaScript and DOM
- Ajax Architecture
- Creating a windows web services
- XMLHttpRequest
- Web services and Ajax
- JPSpan
- DWR
- AJAX using JSON and jQuery

Assignment Lab:

- Replacement of code used for designing of a Login and Registration pages
- Reads JSON data from a web server running PHP and MySQL
- Create an array "myArray" of objects. Use an array literal to declare an array of objects. Give each object two properties: display and url. Create a function to display the array.
- Create a function and put the function call in an external file. Using these display the objects of array and do some modifications in the array objects.
- Design a Login and Registration system using Ajax

Session 13: Responsive Web Design

- Introduction of UI Scripting
- The Best Experience for All Users
  - Desktop

- o Tablet
- o Mobile
- Bootstrap
  - o Overview of Bootstrap
  - o Need to use Bootstrap
  - o Bootstrap Grid System, Grid Classes, Basic Structure of a Bootstrap Grid
  - o Typography
  - o Tables, Images, Jumbotron, Wells, Alerts, Buttons, Button Groups, Badges/Labels, Progress Bars, Pagination, List Groups, Panels, Dropdowns, Collapse, Tabs/Pills, Navbar, Forms, Inputs
  - o Bootstrap Grids, Grid System, Stacked/Horizontal
  - o Bootstrap Themes, Templates

Assignment Lab:
- Design of a Login and Registration pages using above Bootstrap tools
- Testing of web pages designed in HTML5 and modifying the UI as per the above features.