Suggested Teaching Guidelines for
JavaScript Framework –PG-DAC August 2018

Duration: 30 class room hours + 30 lab hours (**60hrs**)

Objective: : To introduce the student to scripts and Facilitate Hands On Experience on Scripting language.

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 , Java script, XML , XHTML, Ajax, PHP and jQuery- Black Book/Dreamtech Press

Reference:
1. Node.js, MongoDB and AngularJS Web Development by Dayley Brad Dayley / Pearson
2. Pro AngularJS by Klaus Freeman Adam Freeman Freeman / Apress
3. AngularJS Services by Paperback / Shroff Publishers & Distributors
4. Angularjs in Action by Lukas Ruebbelke / Dreamtech Press
5. JavaScript: The Good Parts 1st Edition by Douglas Crockford / O'Reilly
6. JavaScript Step by Step 2nd Edition by Steve Suehring/PHI Learning
7. HTML5, JavaScript and jQuery by Dane Cameron/Wiley India
8. Sams Teach Yourself JavaScript in 24 Hours (English) 1st Edition Phil Ballard , Michael Moncur/Pearson Education
9. High Performance JavaScript 1st Edition by ZAKAS / O'Reilly

Session 1: Introduction to JavaScript

- Introduction to JavaScript
- Advantages of using Java Script on client side over VB Script
- Variables in Java Script
- Statements
- Operators
- Comments
- Constructs
- Functions
- Expressions
- JavaScript console
- Scope
- Events
- Strings, String Methods
- Numbers, Number Methods

- Dates, Date Formats, Date Methods
- Arrays, Array Methods
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Assignment Lab:

1. You are having sample html file with a submit button. Now modify the style of the paragraph text through javascript code
2. Writing programs to design a form to input student's data for registering a course.
3. Display a complete date with the name of the Session and name of the month
4. Write a program to sort input strings.
5. Implementing mathematical assignments like factorial, Matrix Multiplication, etc. in Java Script

Session 2:
- Booleans
- Comparisons
- Control Structures
- Conditions
- Switch
- Loop For
- Loop While
- Break
- Functions, Function Definitions, Function Parameters, Function Invocation, Function Closures

Assignment Lab:
1. Write a JavaScript function to validate whether a given value type is Boolean or not
2. Write a JavaScript function to check whether given value types are same or not.
3. Write a JavaScript program to sort a list of elements using Quick sort.
4. Write a JavaScript program to sort a list of elements using Insertion sort.
5. Write a JavaScript program to sort a list of elements using Bubble sort
6. Writing programs for implementing user inputs and displaying the same. Use HTML to design input and output forms. Write functions to implement the above assignments.

Session 3 :

- Objects, Object Definitions, Object Properties, Object Methods, Object Prototypes
- Object Oriented Programming
  - Method
  - Constructor
  - Inheritance
  - Encapsulation
  - Abstraction

   o   Polymorphism

Assignment – Lab:

1. Write a JavaScript program to get the website URL
2. Write a JavaScript program to list the properties of a JavaScript object

Session 4:
- JavaScript Validations
- Document Object Model, Document and Events (DOM Manipulation)
- HTML DOM
- DOM Intro
- DOM Methods
- DOM Document
- DOM Elements
- DOM HTML
- DOM CSS
- DOM Animations
- DOM Events
- DOM EventListener
- DOM Navigation
- DOM Nodes
- DOM Nodelist
- Object hierarchy in Java Script

Assignment – Lab:

1. Validate the resume form using the Java Script

Session 5:
- Debugging
- Type Conversion, Regular expressions
- Errors, Debugging
- Forms
   o   Forms Validation
   o   Forms API

Assignment – Lab:
1. Write a JavaScript function to get the values of First and Last name of the following form
2. Write a JavaScript function to validate whether a given value is RegExp or no

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Session 6:

- JS Browser BOM, Window, Screen, Location, History, Navigator, Popup Alert, Timing, Cookies
- Javascript Windows
- Pushing code quality via JSLint tool
- Security in Java Script

Assignment – Lab:

1. Design Different windows forms to input user commands and process them through output screen

Session 7: Jquery

- Introducing to jQuery
- Basics of jQuery coding
- Selecting the elements
- Bringing pages to life with jQuery
- jquery selection and events
- JQuery Events

Assignment – Lab:
1. Write a jQuery Code to get a single element from a selection, you have the HTML page.
2. Write jQuery Code to add a <b> tag at the beginning of the list item, containing the index of the list item
3. You are having sample data for the link. Write jQuery Code to change the hyperlink and the text of an existing link.

Session 8 & 9: Jquery

- Energizing pages with animations and effects
- jQuery Effects
- jquery traversal and manipulation
- Data attributes and templates
- DOM with jQuery utility functions
- jQuery Plugins
- jQuery / Google Web Toolkit

Assignment – Lab:

1. Write jQuery for the following:
   o Attach a click and double-click event to the <p> element.
   o Hide all headings on a page when they are clicked
   o Find the position of the mouse pointer relative to the left and top edges of the document

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- o Count the number of milliseconds between the two click events on a paragraph.
- o Display the window width while (or after) it is resized
- o Count the number of specific elements
- o Set a timer to delay execution of subsequent items in the queue.
- o Create a Zebra Stripes table effect
- o Print a page using jQuery
- o Make first word bold of all elements

Session 10:
- Introduction to Node.js
- Node modules
- Selectors
- Syntax
- Developing node.js web application
- Event-driven I/O server-side JavaScript

Assignment – Lab:
1. Installing node.js
2. Working with Node modules
3. Write a recursive function in Node.js
4. Write a Node program that prints all the numbers between 1 and 100, each on a separate line. A few caveats:
5. if the number is divisible by 3, print "fizz"
6. if the number is divisible by 5, print "buzz"
7. if the number is divisible by both 3 and 5, print "fizzbuzz"
8. Develop node.js web application

Session 11 : Express
- Introduction to Express
- First Express Application
- Application, Request and Response Objects
- Implementing MVC Pattern
- Express application configuration
- Rendering Views

Assignment – Lab:
1. Installing Express
2. Use Node and Express to write a simple web application that checks whether a number is a prime or not and display message accordingly.
3. Build any previous assignment using Node.js web application using Express Application
4. Create a web application using Node and Express framework

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Session 12 & 13: AngularJS
- Introduction
- Angular 6 Architecture
- Language Choices
- Introduction to Components, Component Interaction & Component Styles
- Templates, Interpolation, and Directives
- Forms, User input, Template-driven Forms, Form Validations
- Data Bindings and Pipes
- Building Nested Components
- Services and Dependency Injection
- Retrieving Data Using HTTP
- Navigation and Routing Basics
- Angular Modules

Assignment – Lab:
Exercise: Setup & Creating Project in Angular
- Creating a new project
- Exploring the File Structure
  TypeScript Configuration File (tsconfig.json) & TypeScript Definitions File (typings.json)
  npm Package File (package.json)
  SystemJS Configuration File (systemjs.config.js)
  index.html File Scripts
- Bootstrapping

Exercise: Handling Events with Event Binding, Two-Way Data Binding
Exercise: Building Out the application with Components, Services, and Providers
Exercise: Working with HTTP, Observables and Reactive Extensions, Sending an HTTP Request, Subscribing to an Observable
Exercise: Configuring Routes, Tying Routes to Actions, Placing the Views

Session 14 & 15: Testing Web Applications

- Introduction to Testing web Applications
- JavaScript Application Testing
- Testing Express Applications
- Testing AngularJS Applications
- Testing based on
  - Functionality Testing
  - Performance Testing
  - Usability Testing
  - Server Side Interface
  - Client Side Compatibility
  - Security

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Assignment – Lab:

- Assignment for testing of different web applications
  - Test if jQuery is loaded.
  - Testing for express application
  - Testing for AngularJS application