**What is Full Stack?**

* Full Stack developers are now trending in software industry.
* Software developer who can handle end-to-end application development.
* Developer can manage database, server-side application, middleware, client-side tools, web server. [Full Stack Developer]
* Front-end to Back-end.

**What we are going learn in Full Stack?**

* Complete front end development. [HTML, CSS, Bootstrap, JS, JQ, Angular JS]
* Server-Side Technologies. [Node JS]
* Database. [MongoDB, MySql]
* Middleware. [Express.js]
* Web Servers. [IIS, Tomcat]
* Cross platform framework for Mobile apps. [Ionic],
* Angular JS
* React.js

**What we can build by using Full Stack?**

* Web Application
* Distributed Application
* Mobile Native Application

**Duration of this course?**

* 100 days 1:15, 1:30

**Who can learn Full Stack?**

* Anyone, no technical knowledge required: Full Stack
* Java, .NET, PHP, Python, Mobile

**Full Stack developer is perfect up to: front end, server side and database.**

**Full Stack developer can’t handle support projects until or unless you have knowledge in Java, .NET, PHP, Python.**

**FAQ: What is difference between Full Stack, MEAN, MERN and UI?**

* **UI is all about “Front End Development”**
  + HTML
  + CSS
  + Bootstrap
  + JavaScript
  + jQuery
  + Angular JS etc.
  + **No database , middleware and server side**
* **MEAN Stack**
  + M MongoDB Database
  + E Express Middleware
  + A Angular Client Side
  + N Node.js Server Side
  + **No Front end tools or language**
* **MERN Stack**
  + M MongoDB Database
  + E Express Middleware
  + R React Client Side
  + N Node.js Server Side
  + **No Front end tools or language**
* **Full Stack**
  + Front End
  + Back End

**Different Types of Applications we are going to learn in Full Stack**

* Web Application
* Distributed Application
* Mobile Native Application

**What is Single Page Application [SPA] and Progressive Web Application?**

* **SPA**
* In SPA user will stay on one page and get access to everything from the page.
* User will not Navigate from one page to another.
* In Web Applications, Distributed Applications and Mobile Native applications we are using SPA environment.
* We will do that by using “Angular JS, React.js and Ionic” for SPA
* **PWA [Progressive Web Applications]**
* In PWA web site will have app like behaviour in browser.
* A web site looks like an “app” not like a page.
* We can do that by using “React.js and Ionic”

**What is UI, UX?**

* Front End development
* UI [User Interface]
* UX [User Experience]
* **UX is part of UI.**
* Web started in early 1990’s
* **Tim Berners Lee** introduced the concept of Web.
* **For Early web development UI is enough.** 
  + HTML, CSS, JavaScript, jQuery etc.
* **Modern web development has several challenges**
  + 80% to 90% of internet users are using web from smart devices.
  + Our traditional websites are too large and can’t reach low bandwidth devices easily.
  + Client wants an
    - Unified UX
      * Our application must provide same features and functionality across any device.
    - Fluid UX
      * User will stay on one page and get access to everything.
    - Easy Extensibility
    - Simplified Deployment.
  + **Solution**
    - Angular JS, React.js etc.

**Front-end Development**

**What is front-end?**

* Software applications follow **tier and layer** architecture.
* Applications are built in **layers**.
* Applications run in **tiers**.

**Tier : run application**

**Layer : build application**

* Developers work in 3 layers
  + UI Layer
  + Business Layer
  + Database Layer
* Application will run in tiers
  + Database Tier
  + Application Tier
  + Presentation Tier
* **Front End development is all about designing the UI.**
* **In full stack we will learn building UI for 3 types of applications**
  + Web Application
  + Distributed Application
  + Mobile Native Application

**What we need to learn for developing UI?**

* HTML
* CSS
* LESS
* SASS
* Bootstrap
* JavaScript
* jQuery
* Angular JS
* React
* Ionic

|  |  |
| --- | --- |
| **Why?** | **Description** |
| HTML | It is a presentation language used for preparing presentation for web, distributed and mobile. |
| CSS | It makes the presentation more attractive, interactive and responsive. |
| LESS | It is a CSS pre-processor. Make your CSS better, simplified, reusable, and compact. |
| SASS | It is also a CSS pre-processor. Make your CSS better, simplified, reusable, and compact. |
| JavaScript | **To reduce burden on server.**  It manages several interactions client-side.  Security Issues, Blocked by Browsers  JavaScript is language used client-side, server-side, database. |
| jQuery | **It is a JavaScript library.**  Write less and do more.  It contains set of pre-defined functions.  Functions are build with JavaScript. |
| Angular JS | **It is a Front-end Framework.**  It can build and control the application flow.  Google |
| React | **It is a JavaScript library.**  **It is used with front-end framework like Cordova, Ionic, NativeScript.**  Facebook  More work is on UI |
| Ionic | Framework for building cross platform mobile application with React or Angular. |

**Front End Web Development**

* **Install Node JS on your computer**
* We are installing node.js for “Package Manager”.
* Package Manager is a software tool used to install various libraries required for your development.
* Library like bootstrap, jQuery, Angular JS etc.
* There are several package managers like: yarn, npm, NuGet, bower, RubyGems
* We are installing Node JS for “npm”.
* You can download from official node.js website

[**https://nodejs.org/en/download/**](https://nodejs.org/en/download/)

* Install on your PC
* Test its version from command prompt.

C:\> node -v

C:\> npm -v [Node Package Manager]

**Download and Install Editor**

* It is an IDE [Integrated Development Environment]
* It provides an environment from where you can build, debug, test and deploy applications.
* We will use “**Visual Studio Code**”
* Open Source
* Cross Platform
* Free
* Lot of plugin for developers
* Microsoft
* Java, .NET, PHP, Python etc.

[**https://code.visualstudio.com/**](https://code.visualstudio.com/)

**Creating a Project for Front End Development:**

* Open your File Explorer
* Create a new folder for project in any location   
  “C:\FullStackWeb”
* Open in Visual Studio Code
  + Go to File Menu 🡪 Open Folder 🡪 C:\FullStackWeb
* Your project is ready to use HTML, CSS and JavaScript.

**How to install library for various languages and technologies?**

* HTML, CSS, JavaScript doesn’t require any library to install on your PC.
* You can start developing directly. Every OS have support for HTML, CSS and JavaScript if it is installed with any browser like: IE, Chrome, Firefox, Safari, Edge etc.
* Package Manager is required for various libraries like jQuery, Angular JS, React etc.
* **Open “Terminal” in Visual Studio Code**
  + Terminal Menu -> New Terminal [Ctrl + `]

C:\FullStackWeb> npm install packageName  
C:\FullStackWeb> npm install jquery/bootstrap/angular/mongodb

**Web Application**

* What is a network?
  + It is a group of computers connecting with each other for sharing of information and resources.
  + **ARPANET [**Advanced Research Projects Agency Network**]** is the first computer network introduced in 1960’s by US-DOD.
* What are types of networks?
  + LAN
  + MAN
  + WAN
* What is internet?
  + It is a Wide Area Network connecting computers across the globe.
  + International Network
* What is Web?
  + 1990’s “**Tim Berners Lee**” introduced “Web”.
  + Web is a portion of Internet with restricted access.
* Who maintains the standards of Web?
  + W3C
  + WHATWG
* Web Terminology

**Web Server**

* Web server resembles both software and hardware.
* It is responsible for managing requests from client and send a customized response to every client request.
* Web Server is the location where we host our website and application, we debug, we test, and deploy.
* The popular web server tools you can use on your computer
  + Apache tomcat
  + IIS [Internet Information Services]
  + NGINX
  + Node.js
  + Lighttpd etc.

**Windows OS – Internet Information Services Manager [IIS] Web Server**

* **Look for IIS on your Windows PC**
  + Open windows control panel
  + Switch to “Large Icons”
  + Go to “Administrative Tools”
  + Look for IIS [Internet Information Services Manager]
* **You can add IIS to your windows PC**
  + Open Control Panel
  + Go to “Programs and Features”
  + Click on “Turn Windows Features ON or OFF”
  + Select “Internet Information Services” from list
  + Click OK
* **Test the webserver**
  + Open any browser: Chrome, IE, Edge etc.
  + Type the following URL in address bar  
    <http://localhost>

<http://127.0.0.1>

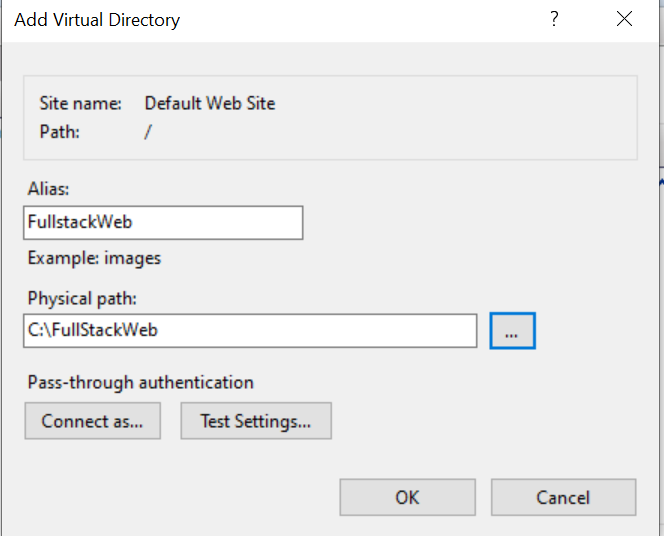
* **Setup Live Server [local] from your Visual Studio Code**
  + Open VS Code
  + Go to “Extensions”
  + Search for “Live Server”
  + Install for your VS Code.

**Web Site**

* Web site is a virtual directory on Web Server.
* Site refers to location on server.
* Location on any computing device is actually Drive and directory reference.

**Creating a new Website Locally:**

* Open your web server “IIS” [Run-> inetmgr]
* Expand “local computer”
* Expand “Sites” folder
* Right Click on “Default Website”
* Select “Add Virtual Directory” [Adding a website]



* <http://localhost/fullstackweb>
* Go to physical path
* Add “Images” folder
* Keep any image in folder
* Now try access from browser

<http://localhost/fullstackweb/images/yourpic.jpg>

**\ - back slash – for physical path**

**/ - forward slash – for virtual path**

**Web Page**

* It is a hypertext document that provides an UI for your website, so that users can interact with the resources in website.
* The term “hyper” refers to a Greek term, which means “beyond”.
* Hypertext document is a special type of document used in network for presentation.
* It comprises of content to display and also the content beyond the display.
* The UI for website is designed by using Web Pages.
* The web pages are classified into 2 types
  + Static Page
  + Dynamic Page

**Static:**

* The term static refers to static memory.
* Static is continuous memory. [Connected in access]
* Memory allocated for first request will continue for other requests.
* Static occupies more memory.
* Static Page contains same information to display across multiple requests.
* Static Page have the extension
  + .htm
  + .html

**Dynamic**

* The term dynamic refers to dynamic memory or non-static memory.
* Dynamic is discrete memory. [Disconnected in access]
* Memory is newly allocated for every request.
* Save the memory.
* Dynamic page contains same content to display initially for every request but it can change and customize the response according to the request.
* It generates a response customized for every client request.
* Dynamic page has extension
  + .jsp
  + .php
  + .asp
  + .aspx etc
* **To design UI for static and dynamic page you need HTML.**

**FAQ: What is difference between a Website and Web Application?**

* Website comprises all static content.
* Web Application comprises of both static and dynamic content.

**FAQ: What is a blog?**

* Web-log [Blog]
* Blogs are like journals on internet.
* Blogging is Free

Ex: blogger.com

* Video Logs are trending [Vlog]

Ex: YouTube Channels are Vlog [Blog]

**FAQ: What is a Wiki?**

* The term Wiki mean “Quick”
* Wiki allows any user to edit its content.

Ex:

WikiPedi [Quick Reference for Encyclopaedia]

IMDB

Google Maps

**FAQ: What is Podcasting?**

* Podcasting allows to upload media (Audio/Video) content on to server and broad cast onto any device connected in network.

Ex: YouTube, iTunes, Windows Media Player

iPOD

**FAQ: What is Widget?**

* It is gadget for your website or application.
* It is an application running in your site or application.
* jQuery is very popular for designing widgets.

**Build a WebSite**

**HTML**