

Building Modern Web Applications & Services using Node.js



Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

Eamonn de Leastar
edeleastar@wit.ie
<https://wit-oth-2017-dmas.github.io>



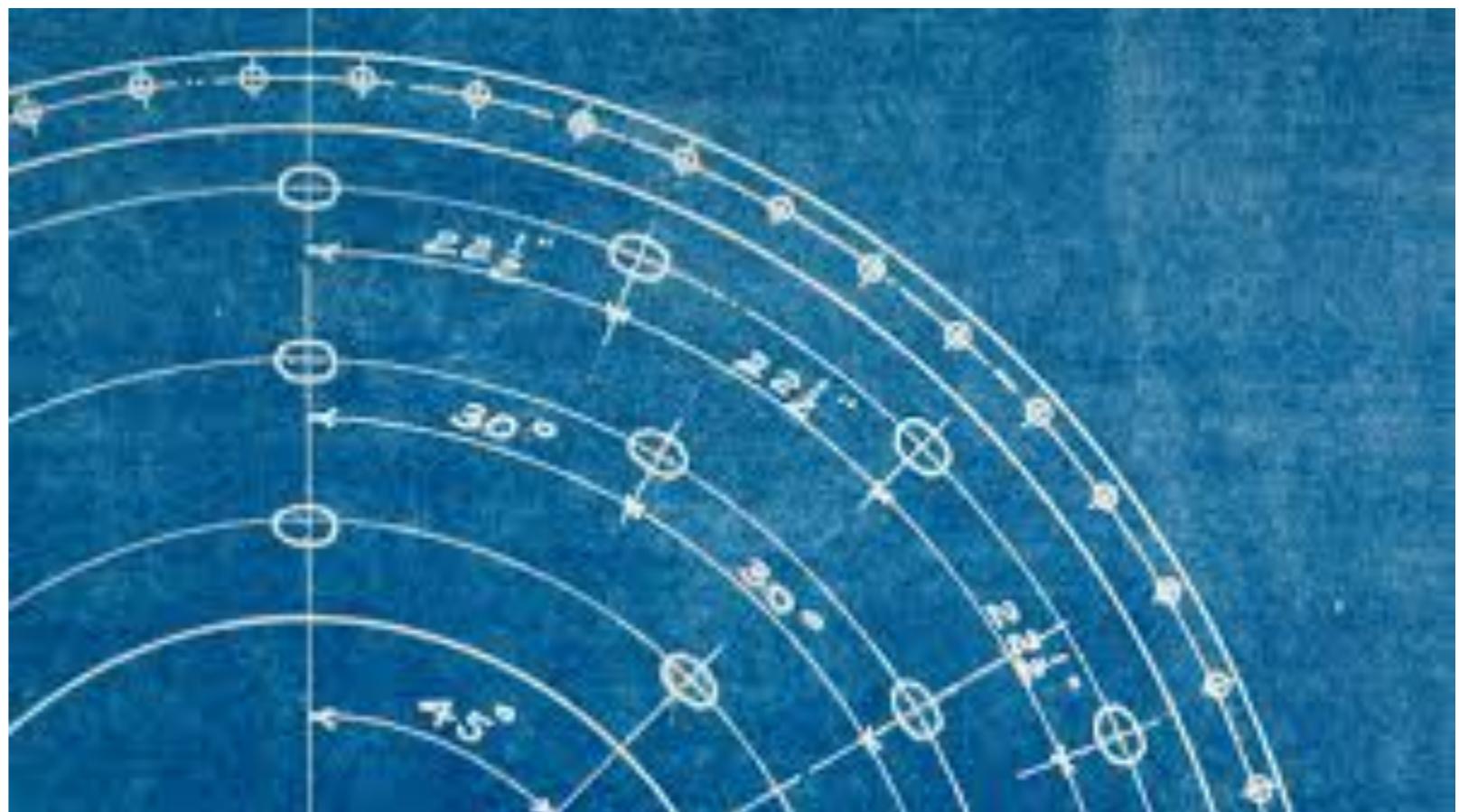
Course Mission

Transfer a set of foundation skills to enable you to design, build, secure, test and deploy a modern web application + API.



Agenda

- Prerequisites
- Preparing for the course
- Brief Overview
- Lab Requirements
- Assessment Guidelines
- Schedule



Perquisites

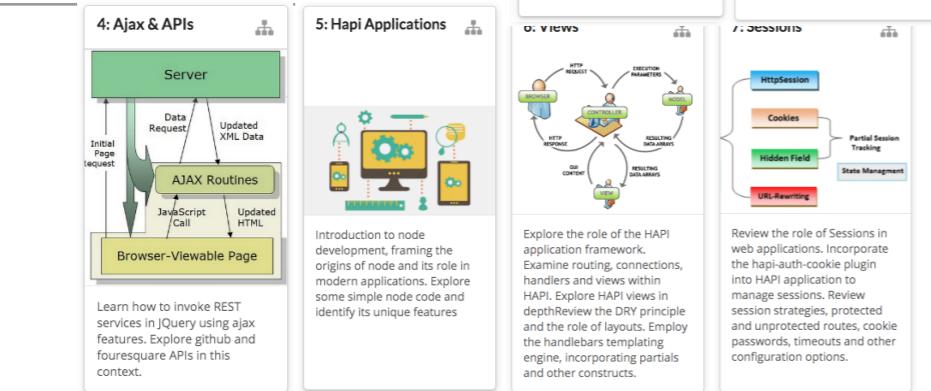
- Foundation level skills in:
 - HTML: Ability to effectively structure the html content of a small to medium static site, including the use of templates
 - CSS: Understand the fundamentals of CSS, and be able to realise simple layouts and designs
 - Javascript: Be familiar with the building blocks of the language and be able to compose realise algorithms to accomplish simple tasks.



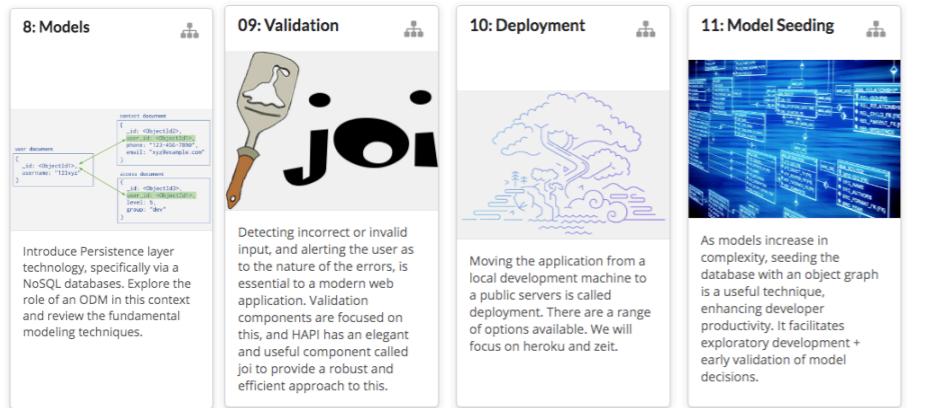
5 Topics Top Level Topics



(1) Front End Foundation (+JS)



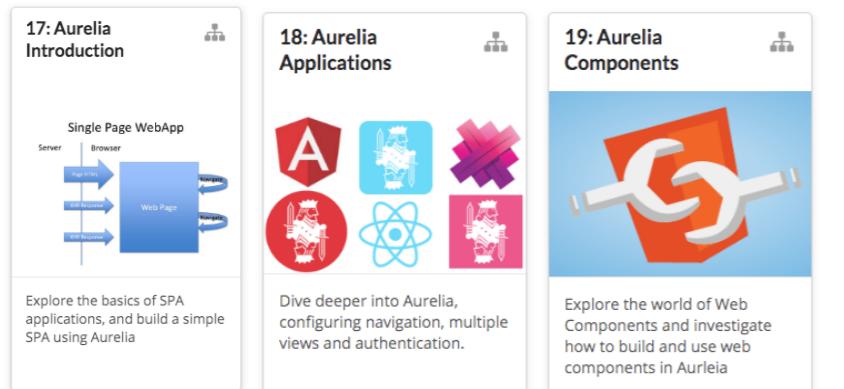
(2) Apis, Node & Hapi Applications



(3) Models, Persistence & Deployment



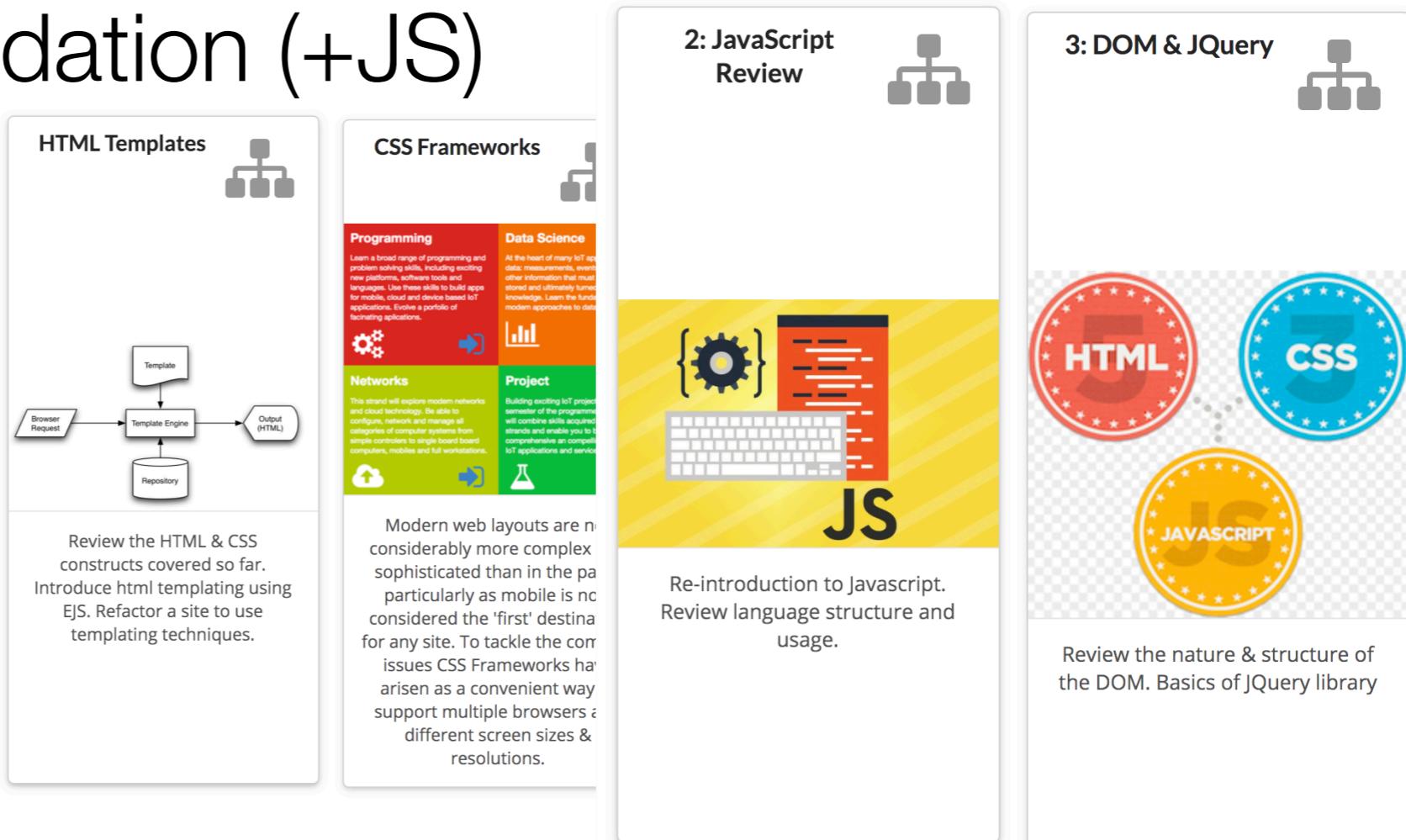
(4) Test Driven API Development



(5) Single Page Applications (TypeScript)

(1) Front End Foundation (+JS)

- Be able to structure and style a simple web site using html5, templating + a CSS framework.
- Understand the fundamentals of Javascript & JQuery



Concepts

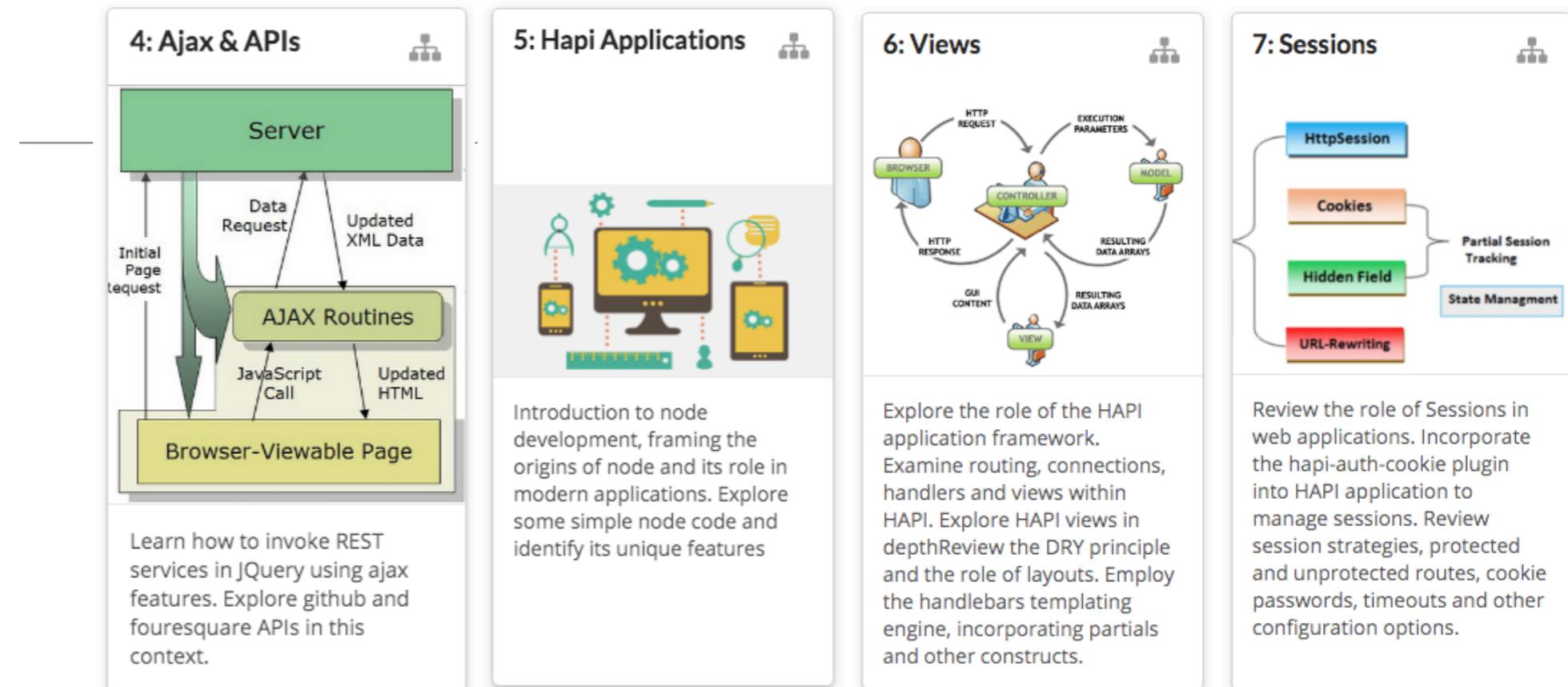
- Review Html + Css, focusing on templates + css frameworks
- Crash course in Javascript Fundamentals
- Learn basics of JQuery

Tools:

- Html5
- Semantic-ui
- jQuery
- Chrome dev tools
- DOM
- WebStorm IDE

(2) Apis, Node & Hapi Applications

- Be able to build a simple Node application incorporating templates views
- Understand and use the fundamentals of session management in the application



management in the application

Concepts

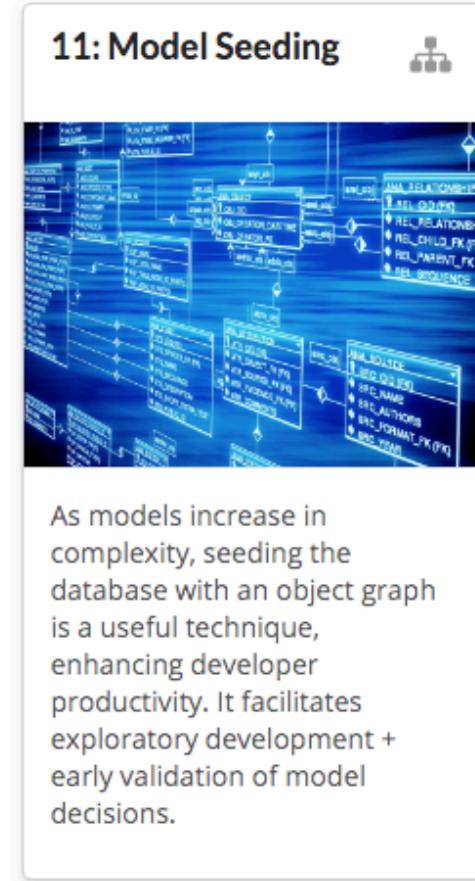
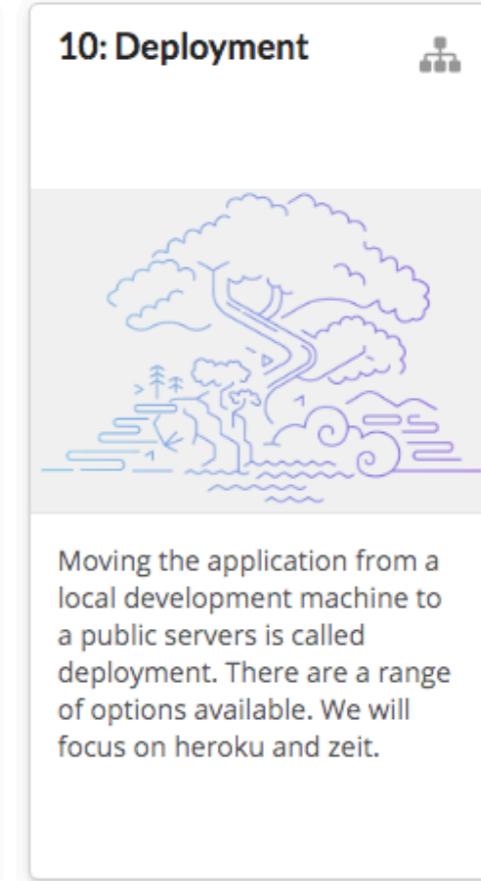
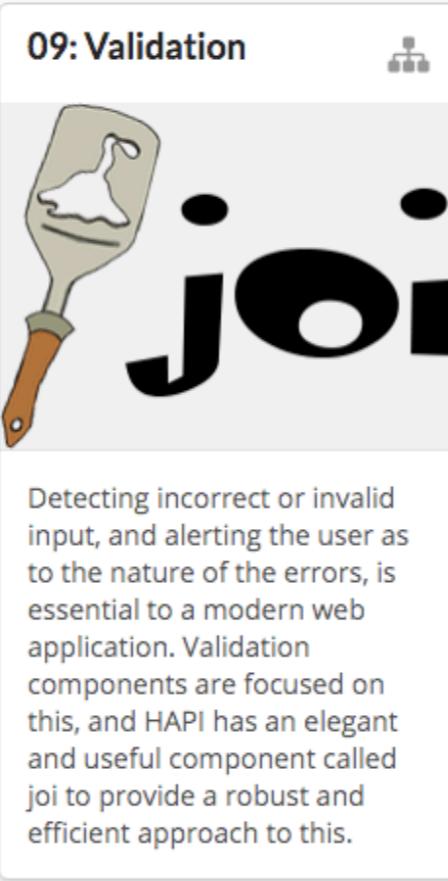
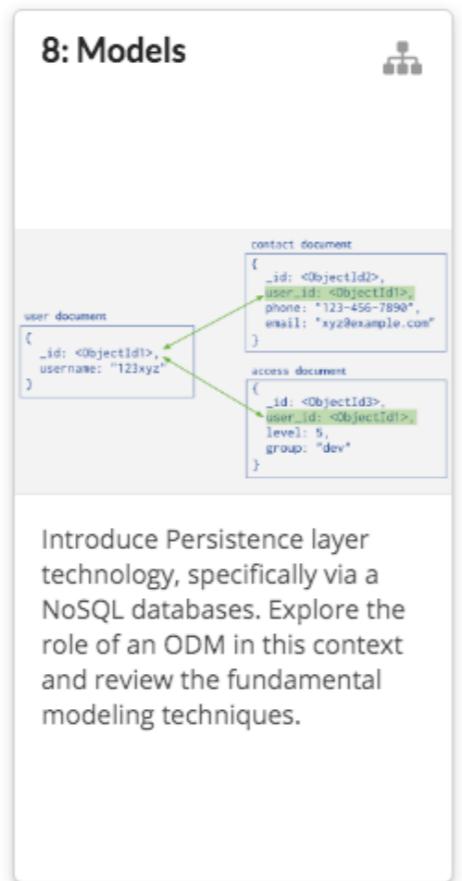
- Accessing APIs in Javascript
- Node.js Fundamentals
- Structure of a Hapi application
- Rendering views & templates
- Session Management

Tools:

- node & npm
- hapi.js
- inert, vision, handlebars, hapi-auth-cookie

(3) Models, Persistence & Deployment

- Introduce persistence mechanisms into an hapi application and be able to employ data validation, seeding.
- Be able to deploy a hapi application



Concepts

- Models & Schema
- Database access
- Validation of data
- Deployment

Tools

- MongoDB
- Heroku toolbelt
- Mongoose, mongoose-seeder, joi

(4) Test Driven API Development

- Be able to design, implement, test and secure a Restful API

12: APIs  <p>Exposing a programmatic interface to a service can facilitate more diverse client. These can include test clients to exercises the application, a mobile application or alternative front ends.</p>	13: TDD <p>Test Driven Development is a keystone technique in modern application development. It comprises of a range of techniques, anchored but the XUnit range of libraries and tools.</p>	14: REST  <p>APIs are said to be Restful if they adhere to a set of principles encompassing URL patterns, payload and general structure.</p>	15: Auth  <p>Securing APIs requires different approach from session based strategies, as we may not have browser on the client. JSON Web Tokens is a well established authentication mechanism for APIs.</p>
--	---	---	---

Concepts

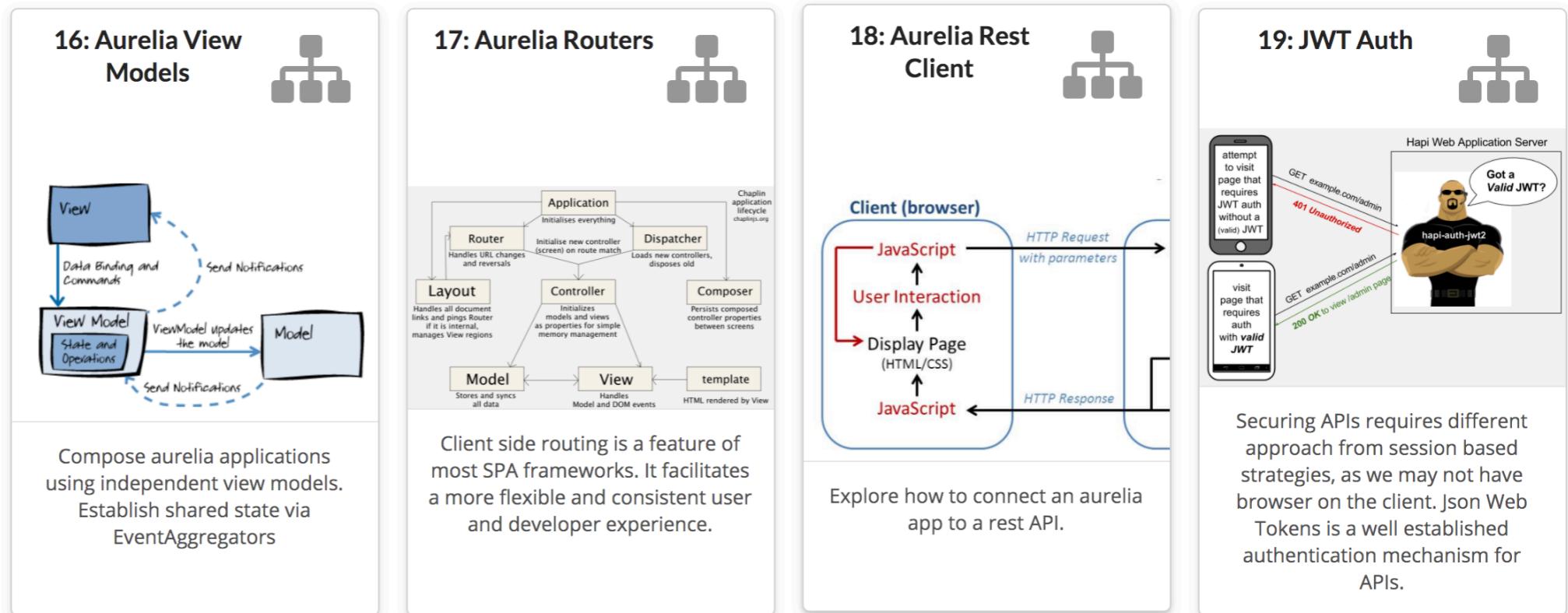
- Constructing a basic API
- TDD, Theory & Practice
- Fundamentals of REST
- Securing REST APIs

Tools:

- sync-request, mocha, chai, jsonwebtoken, hapi-auth-jwt2

(5) Single Page Applications

- Understand the SPA paradigm and be able to build a simple API driven SPA application

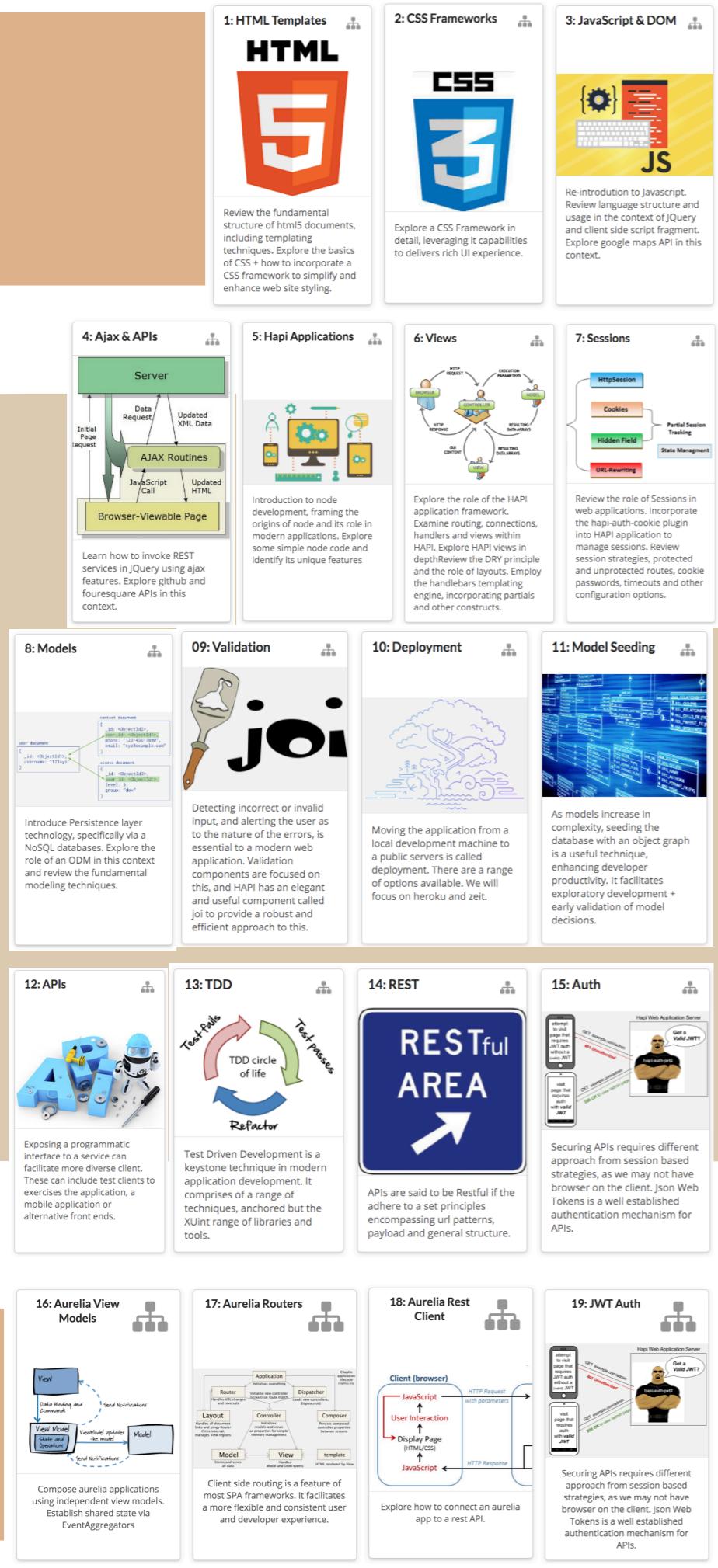


Concepts

- Typescript
- Single Page Applications
- Fundamentals of Aurelia.io
- Aurelia View Models, Routers
- JWT

Tools:

- aurelia.io
- [aurelia-cli](https://github.com/aurelia/cli)



(1) Front End Foundation

(2) APIs, Node & Hapi Applications

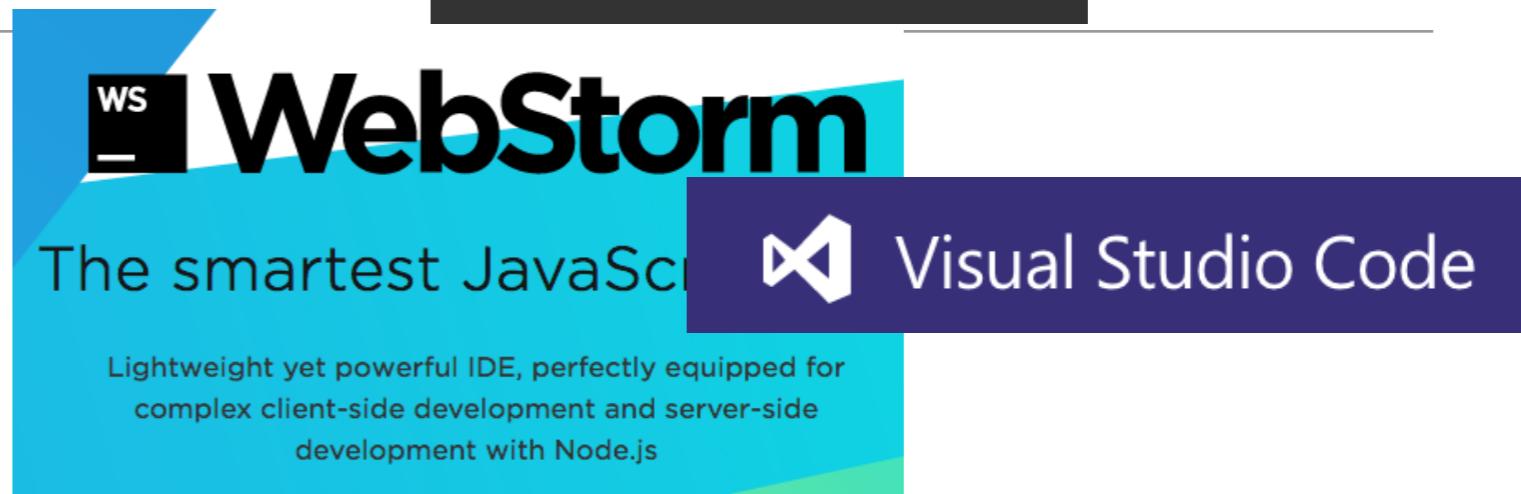
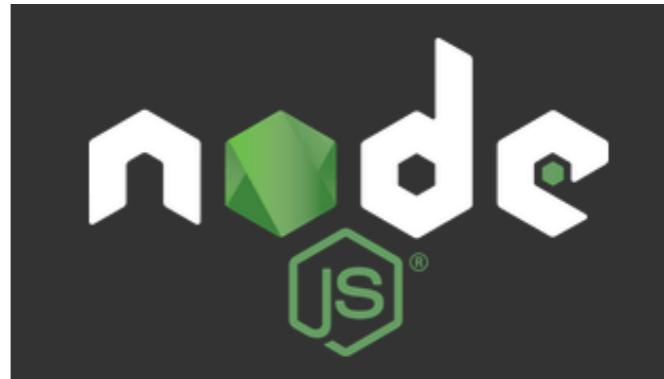
(3) Models, Persistence & Deployment

(4) Test Driven API Development

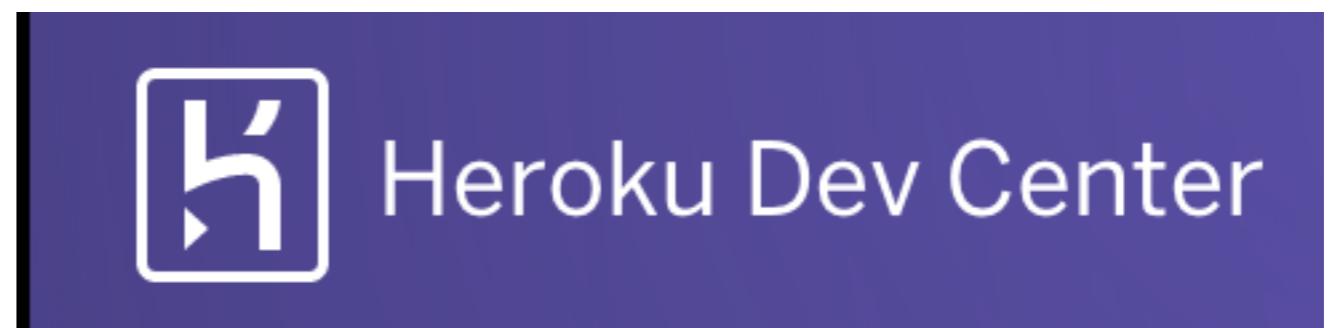
(5) Single Page Applications (optional)

Lab Requirements

- WebStorm 2016
- VSCode
- Node.js
- Mongo DB
- Robo 3T
- Heroku-cli
- + additional libraries & tools as needed in labs



Robo 3T



Schedule (pre and post tuition)

Pre Tuition				
	02/10/2017	09/10/2017	16/10/2017	23/10/2017
18:45 - 20:15	00: Course Overview	01 HTML Templates	02 CSS Frameworks	03 Javascript Review I

	Post Tuition					
	06/11/2017	13/11/2017	20/11/2017	27/11/2017	04/12/2017	11/12/2017
18:45 - 20:15	18 Aurelia Intro	19 Aurelia View/ Models	20 Aurelia Routers	21 Aurelia Rest Client	22 JWT Auth	23 Aurelia & JWT

Schedule (onsite tuition)

	<i>On Site Tuition</i>								
	Sat:28h	Sun: 29th	Mon: 30st	Tue: 31st	Wed: 1st	Thursday 2nd	Friday: 3rd	Saturday 4h	
08:15-09:45									
10:00-11:30	03 Javascript Review II						09 Validation	13 TDD	
11:45-13:15	04 DOM/Ajax					10 Deployment		14 REST	
13:30:15:00	05 Node + HAPI							16 Typescript Intro	
15:15-16:45	06 Views					11 Model Seeding		17 Node + Typescript	
17:00-18:30					07 Sessions	12 APIs			
18:45-20:15					08 Models				

<https://wit-oth-2017-dmas.github.io/>

https://wit-oth-2017-dmas.git x Eamonn

Secure | https://wit-oth-2017-dmas.github.io

Building Modern Web Applications & Services

Module Home

Prepared for OTH Regensburg by Eamonn de Leaster, WIT.
Creative Commons License

1: Introduction

1: HTML & CSS Revision

2: JavaScript Review

3: DOM & JQuery

Introducing the module, assessment and schedule.

Review of the fundamentals of HTML Templating + the Semantic UI CSS Framework

Re-introduction to Javascript. Review language structure and usage.

Review the nature & structure of the DOM. Basics of JQuery library

Ask Questions here:

OPEN CHAT

<https://wit-oth-2017-dmas.github.io>

The screenshot shows a web browser window with the URL <https://wit-oth-2017-dmas.github.io>. The page displays a course module titled "Building Modern Web Applications & Services". The module structure is shown in a tree diagram. A large box on the right contains text about a public chat room and a photo of a man.

Building Modern Web Applications & Services

1: Introduction

1: HTML & CSS Revision

Public Chat Room:
Requires account/
sign in on *https://gitter.im* first

I will drop in
occasionally to
answers any
questions or chat in
general about
course

Click here to type a chat message. Supports GitHub flavoured markdown.

good day all!

Prepared for OTH Regensburg Creative

Module Home

HTML

CSS

JavaScript Orientations

Ajax & APIs

Node.js

RESTful API

Single Page Application

Views

Models

Validation

Deployment

APIs

Model Binding

JSON

REST

Auth

SPA's

Refactor

Introducing the module, assessment and schedule.

STRUCTURAL LAYER

PRESENTATION LAYER

Review of the fundamentals of HTML Templating + the Semantic UI CSS Framework

Eamonn

