CSCI 3800: Web API Technologies
Course Syllabus
Spring, 2017

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Catalog Data: Special Topics in JavaScript Web technologies for front-end development and back-end development. Building a full end to end solution with a mobile or web front-end, Web API and NoSQL database

Co-requisites: N/A
Prerequisites: CSCI 2421-3 Data Structures & Program Design

Note: ***Each student must sign and return the attached Prerequisites Agreement form to receive any credit for any assignment or exam. If this form is not returned by the 1st week, the student will be administratively dropped from the course.***

Expected Knowledge at the Start of the Course:

- Data structures for simplifying algorithm design

Expected Knowledge Gained at the end of the Course:

- Solid understanding of JavaScript, NodeJS, Development of Web APIs, NoSQL Databases and AngularJS/Ionic in a complete solution

ABET Assessment Criteria:

- **(k)** An ability to apply design and development principles in the construction of software systems of varying complexity

Course Objectives:

Textbook: https://leanpub.com/mean-machine

Topics: Web APIs (Design, Best Practices and Development). JavaScript, NodeJS, TypeScript, Angular2, Ionic (Mobile)

Course Outline:

Lecture/ Week	Date	Topic	Reading	Assignments
1	Jan 18th	Syllabus SOAP/WSDL XML and XML Schemas	Introduction to Primers	
2	Jan 24th	HTTP AJAX (Asynchronous JavaScript and XML)	MEAN Thinking to Getting Started and Installation	
3	Jan 31st	JavaScript/jQuery/JSON Pick Teams	Starting Node	**Hw1 Due**
4	Feb 7th	NodeJS	Routing Node Applications to Build a RESTful Node API	
5	Feb 14th	Authorization Basic Auth, oAuth	Node Authentication	
6	Feb 21st	API Design / Swagger / Best Practices		**Hw2 Due**
7	Feb 28th	API Management		
8	March 7th	BaaS / MongoDB	Using MongoDB	**Hw3 Due**
9	March 14th	Policies (limits, throttling)		
10	March 21st	**Spring Break**		
11	March 28th	Analytics		**Hw4 Due**
12	April 4th	TypeScript/Angular2	Starting Angular to Animating Angular Applications	
13	April11th	UX **Hw5 Due**	MEAN Stack Application Structure to Angular Authentication	**Hw5 Due**
14	April 18th	Mobile Ionic		
15	April 25th	IoT, Project Days		
16	May 2nd	Project Presentations		

Grading Policy:

Homework	**65%**
Projects	**35%**

Notes: UCD Code of Honor as in the catalog:
http://catalog.ucdenver.edu/content.php?catoid=6&navoid=530&returnto=search#Academic_Honor_Code_and_Discipline_Policies

Projects

Scenario 1- Deny payment transaction based upon IP address lookup

- Create a proxy with a payment API such as eCommerce. Need to require IP address of the payment accepting client to be included in the transaction.
- Create an inline policy that takes IP address, performs a location lookup and based upon approved location allows the transaction to be processed.
- If denied decline the transaction with a meaningful error message.
- Also store the location where the transaction originated from for future use.

Scenario 2 - Transaction roundup to charity

- Create a payment enabled mobile application (maybe Applepay) using eComm Restful API.
- Before capturing the transaction ask if the user wants to round up to the closest dollar and donate the change to a charity of choice.
- Create summary page for mobile app to show how much the user has donated to charity.
- Also need a method where charities can be made available to donate to.

Scenario 3 - Commerce application intelligence

- Implement a proxy designed to inspect the transaction payload and store the information without latency impact.
- Needs to be configurable and cannot store any sensitive transaction information such as card number, expiration or CVV.
- Implement proxy to access the stored information if stored in app services.