Web Platform and Programming Fundamentals

SES #	Date	TOPICS		HOMEWORK	Comments
LECT 1	**Wed, Feb 8**	**Course Overview**		**HW00 OUT: Dev Env Config**	**HW is Dev Env and Git Setup**
LAB 1	**Fri, Feb 10**	**Dev Environment & Github Setup**		**HW00 DUE, HW01 OUT**	
		Active Learning - Detect Errors in JavaScript File - Submit to Github			*Author: Bruce/Abel*
LECT 2	**Mon, Feb 13**	**Arrays & Objects**			*3 exercises - see below*
	Content:	**Syntax Basics**			
		https://onexi.github.io/abel/05_syntax_basics/slides.html			
	Active Learning:	Soccer Field			
		https://vimeo.com/114083857			
		https://onexi.github.io/abel/05_syntax_basics/slides.html#/26			
		https://onexi.github.io/abel/05_syntax_basics/slides.html#/27			
	Active Learning:	Multiplication Tables			
		https://onexi.github.io/abel/05_syntax_basics/slides.html#/29			
	Active Learning:	Binary Counting			*Write Exercise based on binary counting*
		http://onexi.org/abel/06_binary/slides.html			*Author: Kai/Ranjan*
		http://onexi.org/abel/06_binary/slides.html#/8			
	Content:	**Arrays**			
		Note: use the down arrow to get to the arrays content on slide 2			
		https://onexi.github.io/jrw/L7-SimpleArrays/Arrays.html			
	Active Learning:	Arrays manipulation			*Write Exercise based on arrays manipulation*
		http://onexi.org/jrw/L7-SimpleArrays/Arrays.html#/4			*Author: Kai/Ranjan*
	Content:	**Objects**			
		Simple Object - Object Hello World			
		https://player.vimeo.com/video/88415730			
		Objects - assigning objects to properties			
		https://player.vimeo.com/video/88415803			
		Object - properties with arrays of objects			
		https://player.vimeo.com/video/88415905			
		Objects - deep nesting			
		https://player.vimeo.com/video/88415972			
		Simple function - hello world			
		https://player.vimeo.com/video/88416025			
		Objects - assigning methods to properties			
		https://player.vimeo.com/video/88416110			
		Passing functions as parameters			
		https://player.vimeo.com/video/88416186			
		Variable Scope			
		https://player.vimeo.com/video/88416243			
		Copying by value			
		https://player.vimeo.com/video/88416341			
		Object references			
		https://player.vimeo.com/video/88416419			
		Object properties - reference and value			
		https://player.vimeo.com/video/88416463			
		Objects - multiple references			
		https://player.vimeo.com/video/88416553			
	Active Learning:	Practice with objects			*Write Exercise based on practice with objects*
		http://onexi.org/abel/07_objects/code/objects_and_functions.zip			*Author: Kai/Ranjan*
LECT 3	**Wed, Feb 15**	**Functions**			*3 exercises - see below*
	Content:	**Functions**			
		Slides: http://onexi.org/abel/08_functions/slides.html#/			
		Slides: http://onexi.org/abel/09_functions/slides.html#/			
		Function Basics			
		https://player.vimeo.com/video/87397114			
		Functions are Objects			*Write Exercise on functions are object*
		https://player.vimeo.com/video/87399738			*Author: Kai/Ranjan*
		Scope: Basics			*Write Exercise on scope*
		https://www.youtube.com/watch?v=2e7e0ZsBVEo			*Author: Kai/Ranjan*
		Scope: Forgetting Var			
		https://www.youtube.com/watch?v=xANWzvwg_YI			
		Scope: Nested Functions			
		https://www.youtube.com/watch?v=yKnRUuVeGS4			
		Scope: extra sample			
		https://player.vimeo.com/video/87400167			
		Value and Reference I			
		https://player.vimeo.com/video/87391140			

		Value and Reference II		
		https://player.vimeo.com/video/87400316		*Write Exercise on value and reference*
				Author: Kai/Ranjan
	Active Learning:	Objects and Functions:		
		http://onexi.org/abel/07_objects/code/objects_and_functions.zip		
		Arithmetic Operations		
		http://onexi.org/abel/08_functions/slides.html#/9		
		Functions as properties		
		http://onexi.org/abel/08_functions/slides.html#/14		
		Functions as parameters		
		http://onexi.org/abel/08_functions/slides.html#/14		
		Functions provide scope		
		http://onexi.org/abel/08_functions/slides.html#/22		
		Functions parameters - primitives		
		http://onexi.org/abel/08_functions/slides.html#/28		
		Functions parameters - objects		
		http://onexi.org/abel/08_functions/slides.html#/31		
		Object references		
		http://onexi.org/abel/08_functions/slides.html#/34		
		http://onexi.org/abel/08_functions/slides.html#/35		

LAB 2	Fri, Feb 17	Active Learning Solutions Review	HW01 DUE, HW02 OUT	
Holiday	Mon, Feb 20	Presidents Day		

LECT 4	Wed, Feb 22	JSON, Gov Data, Public APIs, Geospatial		*3 exercises - see below*
	Content:	JSON		
		JavaScript Object Notation (JSON) Basics		*Write Exercise on JSON basics*
		https://player.vimeo.com/video/114087261		*Author: Sam/Nadia*
		Walking through JSON Data		*Write Exercise on walking through JSON*
		https://player.vimeo.com/video/114087424		*Author: Sam/Nadia*
		JSON Debugging		
		https://player.vimeo.com/video/157357371		
	Active Learning:	Find Highest Paid		*Write Exercise on finding highest paid*
		http://onexi.org/abel/09_functions/json_highest_paid.zip		*Author: Sam/Nadia*

LAB 3	Fri, Feb 24	Active Learning Solutions Review	HW02 DUE, HW03 OUT	

Software Architecture

SES #		TOPICS	HOMEWORK	
LECT 5	Mon, Feb 27	Visualization: SVG, Canvas, Data Documents		*3 exercises - see below*
	Content:	Visualization		*Choose as possible from content*
		SVG, Canvas, Data Documents		
		http://onexi.org/abel/10_visualization_jrw/slides.html		
		Geospatial - Spatial + Temporal Information Systems		
		slides: https://onexi.github.io/abel/11_geospatial/slides.html		
		video: https://player.vimeo.com/video/87965564		
	Active Learning:	Public Data and Visualization		*Write Exercise onPublic Data & Visualization*
		http://onexi.org/abel/09_functions/instructions.html		*Author: Sam/Nadia*
		http://onexi.org/abel/09_functions/city_of_boston.zip		
		SVG, Canvas, Data Documents		
		http://onexi.org/abel/10_visualization_jrw/media/files/L10_D3Intro.zip		
		Maps: Add markers		
		http://onexi.org/abel/11_geospatial/slides.html#/16		
		Maps: Add overlay		
		http://onexi.org/abel/11_geospatial/code/class_exercise.zip		
		Maps: Move markers		
		http://onexi.org/abel/11_geospatial/code/marker_move.html		

LECT 6	Wed, Mar 1	Callbacks - forEach, Filter, Sort, Map, Reduce		*3 exercises - see below*
	Content:	Callbacks I		
		Callbacks - Filter, Sort, Map, Reduce (1 lecture - 3 exercises)		
		Slides: http://onexi.org/abel/26_filters_sorting/slides.html		
	Active Learning:	Write a filter		
		http://onexi.org/abel/26_filters_sorting/slides.html#/4		
		Select salaries over 250K		
		http://onexi.org/abel/26_filters_sorting/slides.html#/5		
		Sort by salary		
		http://onexi.org/abel/26_filters_sorting/slides.html#/10		
		Course Catalog Analytics		
		http://onexi.org/abel/26_filters_sorting/slides.html#/13		
		http://onexi.org/abel/26_filters_sorting/code/courseCatalog.zip		
	Content:	Callbacks II		
		Callback Functions in JavaScript		

		https://www.youtube.com/watch?v=GxyFlXbhdsY		
		forEach Callback Functions in JavaScript		*Write Exercise*
		https://www.youtube.com/watch?v=W_WGUEaAdjU		*Author: Abel/Anuj*
		Filter Callback Functions in JavaScript		*Write Exercise*
		https://www.youtube.com/watch?v=N0E7H87PTXM		*Author: Abel/Anuj*
		Sort Callback Functions in JavaScript		
		https://www.youtube.com/watch?v=5g92kS_FaYg		
		Map Callback Functions in JavaScript		*Write Exercise*
		https://www.youtube.com/watch?v=jkEPcEzfaSc		*Author: Abel/Anuj*
		Reduce Callback Functions in JavaScript		*Write Exercise*
		https://www.youtube.com/watch?v=oxFU4P_u_sE		*Author: Abel/Anuj*
		Bringing it all Together		
		https://www.youtube.com/watch?v=M0krX6YdqVw		
	Active Learning	Callback Functions in JavaScript		
		http://onexi.org/abel/26_callbacks/02_callback_code.zip		
		forEach Callback Functions in JavaScript		
		http://onexi.org/abel/26_callbacks/03_forEach_code.zip		
		Filter Callback Functions in JavaScript		
		http://onexi.org/abel/26_callbacks/04_filter_code.zip		
		Sort Callback Functions in JavaScript		
		http://onexi.org/abel/26_callbacks/05_sort_code.zip		
		Map Callback Functions in JavaScript		
		http://onexi.org/abel/26_callbacks/06_map_code.zip		
		Reduce Callback Functions in JavaScript		
		http://onexi.org/abel/26_callbacks/07_reduce_code.zip		
		Bringing it all Together		
		http://onexi.org/abel/26_callbacks/08_catalog_code.zip		

LAB 4	Fri, Mar 3	Active Learning Solutions Review	HW03 DUE, HW04 OUT	

LECT 7	Mon, Mar 6	Node, Non-Blocking, Async Computation		*3 exercises - see below*
	Content:	**Node**		
		Node.js Query parameter/routes		*Write Exercise*
		https://www.youtube.com/watch?v=DyktHOK2DeA		*Author: Anuj/Abel*
		Node.js - Creating Modules		
		https://www.youtube.com/watch?v=f_3wWNjIrps		
	Active Learning:	Write an HTTP Server		
		https://www.youtube.com/watch?v=IJE45xd4oqs		
		Screenscraping - curl exercise		
		http://onexi.org/abel/15_kmeans/code/mitcourses_curl.txt		
		Screenscraping - html minifier exercise		
		http://onexi.org/abel/15_kmeans/code/mitcourses_remove_whitespace.txt		

LECT 8	Wed, Mar 8	Node & NPM		*3 exercises - see below*
	Content:	**Node**		
		NPM Introduction - The Package Manager for Node.js		*Write Exercise*
		https://www.youtube.com/watch?v=qaQmb6fnmkQ		*Author: Anuj/Abel*
		Installing Packages, Locally and Globally		
		https://www.youtube.com/watch?v=936rdnqX9VQ		
	Active Learning:	Create an NPM Package		
		https://www.youtube.com/watch?v=TXxrl8TC1v4		

LAB 5	Fri, Mar 10	Active Learning Solutions Review	HW 04 DUE, HW 05 OUT	

QUIZ 1	Mon, Mar 13	QUIZ 1		

Data Science and Geospatial

SES #		TOPICS	HOMEWORK	
LECT 9	Wed, Mar 15	k-Nearest Neighbor, k-Means		*3 exercises - see below*
	Content:	**kMeans**		*Write Exercise*
		http://onexi.org/abel/14_knn_kmeans/slides.html		*Author: Seonkyoo/Nadia*
	Active Learning:	kMeans		
		http://onexi.org/abel/14_knn_kmeans/code/exercises.zip		
	Content:	**kNN**		*Write Exercise*
		http://onexi.org/abel/15_kmeans/slides.html#/		*Author: Seonkyoo/Nadia*
	Active Learning:	kNN		
		http://onexi.org/abel/15_kmeans/code/exercises.zip		

LAB 6	Fri, Mar 17	Active Learning Solutions Review	HW05 DUE, HW06 OUT	

LECT 10	Mon, Mar 20	Naïve Bayes, Linear Regression		*3 exercises - see below*

Content:		**NaiveBayes**		*Write Exercise*
		http://onexi.org/abel/16_naive_bayes/slides.html		*Author: Seonkyoo/Nadia*
Active Learning:		Tokenize		
		http://onexi.org/abel/16_naive_bayes/code/tokenize.js		
		Increment words		
		http://onexi.org/abel/16_naive_bayes/code/incrementWords.js		
		Calculate probability		
		http://onexi.org/abel/16_naive_bayes/code/calculateProbability.js		
		Underflow Prevention		
		http://onexi.org/abel/16_naive_bayes/code/underflow_scores.js		
Content:		**Regression**		*Write Exercise*
		http://onexi.org/abel/14_knn_kmeans/slides.html		*Author: Seonkyoo/Nadia*
Active Learning:		Regression		
		https://onexi.github.io/jrw/L14_MachineLearning/media/files/regression2_exercise.zip		

SES #	Date	TOPICS	HOMEWORK	
LECT 11	**Wed, Mar 22**	**Data Modeling & Data Stores**		***3 exercises - see below***
		Active Learning - Lowdb, json-server, sqlite		*Author: Abel/Anuj*
LAB 7	**Fri, Mar 24**	**Active Learning Solutions Review**	**HW06 DUE, HW07 OUT**	
Vacation	Mon, Mar 27	Spring Break		
Vacation	Wed, Mar 29	Spring Break		
Vacation	Fri, Mar 31	Spring Break		
LECT 12	**Mon, Apr 3**	**Representational State Transfer (REST)**		
		Active Learning - TBD		*Author: TBD*
LECT 13	**Wed, Apr 5**	**Service Orchestration**		
		Active Learning - TBD		*Author: TBD*
LAB 8	**Fri, Apr 7**	**Active Learning Solutions Review**	**HW07 DUE, HW08 OUT**	
LECT 14	**Mon, Apr 10**	**Sensors & Devices: Tessel I**		
		Active Learning - TBD		*Author: Bruce*
LECT 15	**Wed, Apr 12**	**Sensors & Devices: Tessel II**		
		Active Learning - TBD		*Author: Bruce*
LAB 9	**Fri, Apr 14**	**Active Learning Solutions Review**	**HW08 DUE, HW09 OUT**	

Project				
SES #		**TOPICS**	**HOMEWORK**	
Holiday	Mon, Apr 17	Patriots Day		
QUIZ	**Wed, Apr 19**	**Quiz 2**		
LAB 10	**Fri, Apr 21**		**HW09 DUE, HW10 OUT**	**Project - Phase 1**
LECT 16	**Mon, Apr 24**	**Project**		
LECT 17	**Wed, Apr 26**	**Project**		
LAB 11	**Fri, Apr 28**		**HW10 DUE, HW11 OUT**	**Project - Phase 2**
PROJ 01	**Mon, May 1**	**Project**		
PROJ 02	**Wed, May 3**	**Project**		
PROJ 03	**Fri, May 5**		**HW11 DUE, HW12 OUT**	**Project - Phase 3**
PROJ 04	**Mon, May 8**	**Project Presentations**		
PROJ 05	**Wed, May 10**	**Project Presentations**		
PROJ 06	**Fri, May 12**	**Project Presentations**	**Project Due Date**	