Professional Applications and Frameworks in Web Development

ITP 405x (3 Units)

Objective

Provide students with the necessary skills to build server-side applications and APIs using frameworks and tools common in the industry.

Concepts

The course will cover how to build server-side web applications and APIs. We will also look at the differences between traditional server-side technologies like PHP and how it differs from Node.js, an asynchronous server-side alternative using JavaScript.

Prerequisites

ITP 300 (or sufficient experience). You should be proficient with the basics of building dynamic web pages using HTML, CSS, SQL, and some server-side technology.

Lecture

3 hours / week

Course Structure

The first half of the course will cover the fundamentals of building traditional server-side rendered web applications and the PHP framework, Laravel. The second half of the course will cover building APIs using Node.js (server-side JavaScript) and how asynchronous programming differs from synchronous programming.

Required Reading

PHP Object Oriented Solutions by David Powers: Apress, 2013 – There is a free version provided by USC. Visit [this link](). Click the link next to Electronic Access that says "» SpringerLink - An electronic book accessible through the World Wide Web; click for information". Log in with your USC credentials, and then you can download the book in PDF format.

You can also find used copies of the book on Amazon for very cheap.

Grading

Assignments: 25%
Labs: 10%

Assignments and labs are due the following week at midnight.

Class participation and attendance: 10%

Exam: 20%
Individual final project: 35%

Final course grade is determined by standard formulas:

A   100% - 93%
A-   92% - 90%
B+   89% - 87%
B   86% - 83%
B-   82% - 80%
C+   79% - 77%
C   76% - 73%
C-   72% - 70%
D+   69% - 67%
D   66% - 63%
F   62% and below

Policies
It is the responsibility of the student to make sure assignments, labs, and the final project are turned in on time via GitHub.

Academic Integrity
The use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student, and similar behavior that defeats the intent of an examination or other class work is unacceptable to the University. It is often difficult to distinguish between a culpable act and inadvertent behavior resulting from the nervous tension accompanying examinations. When the professor determines that a violation has occurred, appropriate action, as determined by the instructor, will be taken.

Although working together is encouraged, all work claimed as yours must in fact be your own effort. Students who plagiarize the work of other students will receive zero points and possibly be referred to Student Judicial Affairs and Community Standards (SJACS).

All students should read, understand, and abide by the University Student Conduct Code listed in SCampus, and available at:
http://www.usc.edu/student-affairs/SJACS/nonacademicreview.html

Students with Disabilities
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to your TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Course Outline

1/9	Class Introduction Traditional vs. API driven web applications Installing PHP, Sequel Pro/MySQL Workbench/TablePlus Intro to Git and Github Reading: PHP Object Oriented Solutions – Chapter 1 & 2
1/16	HTTP lifecycle Database-driven web pages review SQL joins PHP Data Objects (PDO), Prepared Statements, and Parameter Binding **Assignment**
1/23	Object Oriented Programming in PHP Classes, Inheritance, Statics, Namespaces **Lab**
1/30	Model-View-Controller (MVC) Laravel – Routes, Controllers, Query builder, and Views **Assignment**
2/6	Laravel – CRUD, flash messages, data validation **Assignment**
2/13	Laravel - Object Relational Mapping (ORM) **Assignment**
2/20	Laravel - Middleware and Authentication **Lab**
2/27	Exam
3/6	Intro to Node.js and NVM Asynchronous programming with callback functions Building an API with Express **Assignment**
3/13	Spring Break
3/20	Asynchronous programming with promises Object Relational Mapping in Node

Assignment

3/27	Working with APIs using OAuth 2 - Client Credentials grant type **Lab**
4/3	Authentication for Single Page and Mobile Applications - Part 1 OAuth 2 and the Resource Owner Password Credentials grant type JSON Web Tokens (JWT)
4/10	Authentication for Single Page and Mobile Applications - Part 2
4/17	Asynchronous programming with async/await The Koa framework **Lab**
4/24	Deployment with a Platform-as-a-Service (PaaS)

Final Project due Sunday 4/29 at midnight

The final project can be on any topic of interest to you. Requirements will be sent out mid semester.