Advanced Back-End Web Development

ITP 405x (4 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 303, ITP 304, ACAD 276, or sufficient experience. You should be proficient with the basics of building dynamic web pages using HTML, CSS, SQL, and any server-side technology.

Lecture
Tuesday 5pm - 8:20pm

Required Reading
PHP Object Oriented Solutions by David Powers: Apress, 2013 – There is a free e-book version for USC students at
https://link-springer-com.libproxy1.usc.edu/book/10.1007%2F978-1-4302-1012-2.

Grading
Assignments: 40%
Written exam: 15%
Practical exam: 15%
Individual final project: 30%

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

Assignment Due Dates
Assignments are due the following week before class (Tuesday at 5pm) unless stated otherwise. Failure to turn in assignments by the due date will result in a 0. No extensions. Your lowest assignment score will be dropped.

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   Course introduction
                Git, GitHub, and GitHub Classroom

1/16   Review database-driven web pages with PHP
                SQL Joins

PDO, prepared statements, and parameter binding
Assignment 1

1/23   The Model-View-Controller (MVC) pattern
Laravel - routes, controllers, query builder, views
Assignment 2

1/30   Laravel - CRUD, flash messages, data validation
Assignment 3

2/6   Laravel - Object Relational Mapping (ORM)
Assignment 4

2/13   Laravel - Running migrations, authentication, built-in middleware
Assignment 5

2/20   Laravel - Writing migrations, custom middleware
Assignment 6

2/27   Practical exam

3/5   Laravel - Authorization with Gates and Policies
Assignment 7

3/12   Spring Recess

3/19   Laravel - Consuming Third-Party APIs, Caching
Assignment 8

3/26   Laravel - Building a REST API

4/2   Laravel - Mail and Queues

4/9   Introduction to Node.js and Asynchronous Programming (part 1)
Written exam at 6pm in person

4/16   Introduction to Node.js and Asynchronous Programming (part 2)

4/23   Guest Lecture TBA

The final project is due on Sunday 4/28 at 11:59pm.