Objective
Provide students with the necessary skills to build structured, maintainable, scalable, and tested web sites and applications using frameworks and tools common in the industry.

Concepts
This course will cover topics including object oriented programming, the model-view-controller pattern, web services and API’s, REST, object relational mapping, and automated testing using unit and integration tests. The course will also cover the differences between traditional server-side technologies like PHP and Ruby and how they differ from Node.js, an asynchronous server-side alternative with JavaScript.

Prerequisites
ITP 300 or CSCI 351 (or sufficient experience)

Lecture
3 hrs / week

Course Structure
Students are expected to:

• Participate in lecture discussions and critiques
• Complete weekly lab assignments and projects
• Manage and complete individual class projects

Students are responsible for completing assignments and projects by stated deadlines. Most assignments will be uploaded by students to their USC Web space and posted in an itp499 directory.

Recommended Textbooks
PHP Object Oriented Solutions by David Powers: Apress, 2013

Grading
Assignments: 35%
Class Participation & Labs: 10%
Midterm: 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 projects and assignments are turned in on time. Make sure you follow the procedures outlined in each assignment or project.

Late projects will be reduced a letter grade per day after the assignment was due. No projects will be accepted later than five days from the due date.

**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](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

### Week 1
- Class Introduction
- Environment setup
- OOP Optional Workshop 1

### Week 2
- Web request/response lifecycle
- Database-driven web pages review
- OOP Optional Workshop 2
- Assignment

### Week 3
- Intermediate SQL – Joins, Aggregate Functions
- OOP Optional Workshop 3
- Assignment

### Week 4
- Object Oriented Programming in PHP
- Assignment

### Week 5
- PHP Namespacing
- Autoloading
- Dependency management
- Assignment

### Week 6
- MVC Frameworks 1 – Controllers, Views, & Routing
- Assignment

### Week 7
- MVC Frameworks 2 – Models & Validation
- Assignment

### Week 8
- MVC Frameworks 3 - Models revisited w/ Object Relational Mapping
- Assignment

### Week 9
- Midterm

### Week 10
- Spring Break

### Week 11
- Web Services & API’s
- Application structure
- Server-side caching
- REST overview
- Writing a RESTful API
- Assignment

### Week 12
- Testing overview & terminology
- What should be tested?
- Introduction to Unit Testing with PHPUnit
Assignment

Week 13  Unit Testing continued – Writing testable code
Test Doubles
Dependency injection

Assignment

Week 14  Introduction to Node.js

Assignment (optional)

Week 15  Node.js – Flow control

Week 16  Project Presentations