Course Description
This course teaches the fundamentals of relational database management systems (RDBMS) and how to design and implement databases. Students will learn the Structured Query Language (SQL) for communicating with databases. They will learn and use the PHP scripting language to make SQL calls to databases and to flow those results into pages. Students will also use PHP to create data interfaces, as well as to create basic conditional routines and other constructs that allow for dynamic sites. They will perform basic analytics and will learn the fundamentals of alternative data structures, enterprise databases, and "big data" systems.

Learning Objectives
From e-commerce to news and information, modern web sites do not contain thousands of hand-coded pages. Sites are driven by web "templates" that flow in information from databases or other data sources. Student will learn the basics of creating data structures to house the core "data" of web sites and user server-side scripting to "flow" that information into web templates. They will also learn the basic techniques for tracking user behavior and traffic, and the fundamentals of performing analytics on that data.
Prerequisite: Acad275

Required Textbook: None

Grading Breakdown

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<tbody>
<tr>
<td>Assignment</td>
<td>35%</td>
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<tr>
<td>Attendance and Labs</td>
<td>15%</td>
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<tr>
<td>Examination</td>
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<td>Major Project</td>
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<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
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Grading Scale

The following shows the grading scale to be used to determine the letter grade.

- A: 100-94
- A-: 94-90
- B+: 90-87
- B: 86-83
- B-: 83-80
- C+: 80-77
- C: 77-73
- C-: 73-70
- D+: 70-67
- D: 67-64
- F: 64 or below

Major Project

Students will work in groups to build a database-driven web site built in MySql and PHP. The site will feature a secured administrative back-end, track user behavior and traffic, and feature custom modules.

Project Timeline:

- **Due Week 9a**
  - Milestone 1: User Research, Proposal, DB v1, Logos, Frontpage designs
- **Due Week 10b**
  - Milestone 2: Frontpage build, Search and Result pages, Design / Style Guide
- **Due Week 12a**
  - Milestone 3: User Testing Results
- **Due Week 13a**
  - Milestone 4: Login, Admin, Majority of Site Pages
- **Due Week 14**
  - Final Build: Complete, Dynamic Site, Summary and Write Up
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 linked from an assignment page.

Policies

No make-up exams (except for documented medical or family emergencies).

Due dates and requirements for all Labs and Assignments will be posted on the course site. Students will “post” their work to their USC web space as defined on the course site.

It is the student’s responsibility to post work by the due date following the defined class procedures, even if you miss class. Work turned in late will lose 10% credit per day and late work is not accepted after two weeks past the due date. To receive credit for late work you MUST email the grader that you posted a lab or assignment after the due date or you will not receive credit.

An attendance sheet will be circulated each lecture. You must sign in for lecture to receive lecture attendance credit.

Academy Student Attendance Policy

The Academy maintains rigorous academic standards for its students and on-time attendance at all class meetings is expected. Each student will be allowed two excused absences over the course of the semester for which no explanation is required. Students are admonished to not waste excused absences on non-critical issues, and to use them carefully for illness or other issues that may arise unexpectedly. Except in the case of prolonged illness or other serious issue (see below), no additional absences will be excused. Each unexcused absence will result in the lowering of the final grade by 1/3 of a grade (e.g., an A will be lowered to A-, an A- will be lowered to B+, etc.).

Students remain responsible for any missed work from excused or unexcused absences. Immediately following an absence, students should contact the instructor to obtain missed assignments or lecture notes and to confirm new deadlines or due dates. Extensions or other accommodations are at the discretion of the instructor.

Automatically excused absences normally may not be used for quiz, exam or presentation days. Using an excused absence for a quiz, exam or presentation, such as in the case of sudden illness or other emergency, is at the discretion of the instructor.

In the case of prolonged illness, family emergencies, or other unforeseen serious issues, the student should contact the instructor to arrange for accommodation. Accommodation may also be made for essential professional or career-related events or opportunities. All accommodations remain at the discretion of the instructor, and appropriate documentation may be required.
HOW TO PURCHASE OPTIONAL SOFTWARE AT THE DISCOUNTED ACADEMY RATE THROUGH THE USC BOOKSTORE:

The following first year software are now available for purchase online through the USC Bookstore at the Academy discounted rate:

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<thead>
<tr>
<th>Software</th>
<th>IYA Short-Term License at USC Bookstore</th>
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</thead>
<tbody>
<tr>
<td>Adobe Creative Cloud</td>
<td>$70 2019-2020 annual license</td>
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1. Visit the USC Bookstore online: [https://www.uscbookstore.com/usciyasoftware](https://www.uscbookstore.com/usciyasoftware)
2. Select the software license(s) you would like to purchase.
3. When you proceed to checkout, add the Promo Code “IYASoftware” (This will override the listed taxes).
4. For shipping, select FedEx Home Delivery (free).
5. Once you complete your online purchase, you will receive a confirmation email/receipt. *(Note that even if a shipping charge appears on your invoice, it will not be charged to your credit card. This relates to a known technical problem with the Bookstore’s online store.)*
6. Upload your receipt [here](https://www.uscbookstore.com/usciyasoftware) to receive access to your purchased license.
7. You will be notified by email when the license has been activated.
Dev 2: Server-side web development, databases and analytics

Course Outline

| Week 1a | Aug 18 | Course introduction and overview. Web server and content workflow.  
Lab: Install mySql Workbench (due W1b) |
|---|---|---|
| Week 1b | Aug 20 | Database fundamentals, designing databases for web content, major db platforms. MySQL, working with MySQL Workbench.  
**Assignment:** DB schema (due W2a) |
| Week 2a | Aug 25 | Introduction to Structured Query Language (SQL). Reading data with SELECT and WHERE. Views.  
**Assignment:** SQL statements pt 1 (due W2b) |
| Week 2b | Aug 27 | SQL Review. Inserting, updating and deleting records, reformating data. Introduction to phpmyadmin.  
**Assignment:** RVS db schema. SQL statements pt 2 (due W3a) |
| Week 3a | Sep 01 | Introduction to PHP and PHPStorm.  
Introduction to PHP Scripting Language and basic tags  
**Lab:** Assignment Web page (due W3b)  
**Assignment:** Class schedule database (due W3b) |
| Week 3b | Sep 03 | PHP and MySQL (mysqli). Populating pages with content from db. Looping through queries.  
**Assignment:** Search and Result pages (due 4a) |
| Week 4a | Sep 08 | Php conditional statements. Populating select menus.  
**Assignment:** Search, Result pages v2 (due 4b) |
| Week 4b | Sep 10 | Review php “if”, dynamic menus. Creating “insert” forms.  
**Lab:** Db backup/export.  
**Assignment:** Add, Insert pages (due 5a) |
| Week 5a | Sep 15 | Drill-down workflow 1: Search, Results, Details  
**Lab:** Search, result, details pages (due 5b)  
**Assignment:** Project proposal, db sketch and pitch videos (due 6a) |
| Week 5b | Sept 17 | Drill-down workflow 2: Results, Edit, Delete  
**Assignment:** Edit/update pages. (due 6a) |
Week 6a  Sep 22  Review drill-down, form objects.
Exam preparation.

Week 6b  Sep 24  Group project pitches and discussions.

Week 7a  Sep 29  
**PHP and SQL Examination**

Week 7b  Oct 01  Db exercise. Many-to-many joins, cross-reference tables.
**Assignment:** Project M1: User Research, Proposal, Db, Logos (due 9a)

Week 8a  Oct 06  Exploring Group Databases. Aggregate SQL.
**Assignment:** Group production schedule/gantt (due 8b+)

Week 8b  Oct 08  Creating emails with php. Images in databases.
File uploads with php.
**Assignment:** Add images to class schedule (due 9a)

Week 9a  Oct 13  Paginated results.
**Assignment:** Project M2: Fronts, search/results, styleguide (due 11a)

Week 9b  Oct 15  Group project initial designs critique

Week 10a  Oct 20  Review php includes. Session and client variables.
Login routines.
**Lab:** Php log-in, security sandbox (due W10b).

Week 10b  Oct 22  Introduction to Security Topics. Discussion of workflow and UX approaches for creating user accounts, email verification.
Overview of Tech Courses beyond Acad276

Week 11a  Oct 27  Github and source control. Special Topics.
**Assignment:** Project M3: User Testing (due W12a)
**Assignment:** Project M4: Login, admin, most of site (due W13a)

Week 11b  Oct 29  Group Project Design, Comm Critique
Intermediate db topics: Setting foreign key constraints.
Enforcing key constraints, many-to-many joins.
DB transactions, locking. Sub-queries.

Week 12a  Nov 03  Introduction to Analytics.

Week 12b  Nov 05  Integrating Javascript into php-driven sites.
| Week 13a | Nov 10 | Introduction to MVC, PHP frameworks and Laravel.  
           **Assignment:** Project M5: Final build (due w16a) |
|----------|--------|------------------------------------------------------------------|
| Week 13b | Nov 12 | Beyond Dev2: server-side technologies, hosting, CMS  
           Next-generation development |
| Nov 17   |        | GROUP Project Final Build posted |
| (TBA)    | Nov 17 | Student Presentations of Group Projects at 2pm |
Possible Special Topics:

Data Visualization (GL)

Caching

Additional intermediate PHP Functions

Laravel PHP Framework

Advanced Joins

Query Performance Optimization

Business Intelligence Systems Part 1: Big data, data warehousing,

Business Intelligence Systems Part 2: business reporting, data mining

Analytics Special Topics

Quality Assurance processes and phases

The Web development industry

Industry Event or Tour
Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Student Health Counseling Services - (213) 740-7711 – 24/7 on call engemannshc.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fairness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) 
-213-740-9355 (WELL https://studenthealth.usc.edu/sexual-assault/
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Relationship and Sexual Violence Prevention and Services provides immediate therapy services for situations related to gender- and power-based harm (e.g., sexual assault, domestic violence, stalking).

Office of Equity and Diversity (OED) | Title IX - (213) 740-5086 equity.usc.edu, titleix.usc.edu
Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

USC Policy Reporting to Title IX (213) 740-5086 https://policy.usc.edu/reporting-to-title-ix-student-misconduct/
The university encourages individuals to report prohibited conduct to the Title IX Office. Individuals can report to the university Title IX Coordinator in the Office of Equity and Diversity.

Bias Assessment Response and Support - (213) 740-2421 studentaffairs.usc.edu/bias-assessment-response-support
Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.
Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

**USC Support and Advocacy - (213) 821-4710**
studentaffairs.usc.edu/ssa
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

**Diversity at USC - (213) 740-2101**
diversity.usc.edu
Information on events, programs and training, the Provost’s Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

**USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call**
dps.usc.edu, emergency.usc.edu
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

**USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call**
dps.usc.edu
Non-emergency assistance or information.