

USC Iovine and Young Academy

*Arts, Technology and the Business
of Innovation*

Acad274: Designing Interactive Data Systems

4 unit

Spring 2025

Tuesdays and Thursdays 4pm

Course Site: <http://iyawebdev.com/acad274>

Instructor: **Patrick Dent**

dent@usc.edu / 213-821-1400

(Note email preferred method of contact, will endeavor to response within 24 hrs M-F)

Office Hours: *TBA*

And additional individual hours by appointment.

Grader: **Dhruvam Zaveri (dzaveri@usc.edu)**

IT Help: <https://uscedu.sharepoint.com/sites/IYASStudent/SitePages/IT-Resources.aspx>

Hours of Service: 8:30 a.m. – 6:30 p.m.

Contact Info: iyahelp@usc.edu

USC Technology Support Links

[Zoom information for students](#)

[Blackboard help for students](#)

[Software available to USC Campus](#)

Course Objective

Interactive data systems and simulations allow users to not only gain insights from results and conclusions but to adjust inputs, figures and assumptions to make informed business decision and projections.

In this course students will design and build interactive, web-based interactive data systems and simulations. The course will introduce students to foundations in three distinct (but interrelated) areas: 1) data structures and storage, querying and retrieving data, 3) information design and data visualization, and 3) interactive web scripting.

Using both provided data structures and databases and ones they design and implement, students will extract data and evaluate alternative ways to display the results, then build interactive web-based simulations that allow users to project different outcomes and conclusions by interacting with the data.

Learning Objectives

At the conclusion of the course students will have:

- A working knowledge of relational database and SQL
- Experience building and querying data structures
- A basic understanding of information design and data visualization
- A Foundational knowledge of web scripting
- Built a custom web-based, interactive data simulation

Required Readings and Supplementary Materials

No required course textbook. Lecture notes, online resources and other readings will be posted on the course site.

HOW TO PURCHASE SOFTWARE AT THE DISCOUNTED ACADEMY RATE

The following software are available for purchase online at the Iovine and Young Academy discounted rate:

Software	IYA Short-Term License at USC Bookstore
Adobe Creative Cloud	\$70 2024–2025 annual license (active through July 2025)

To purchase:

- Visit: <https://commerce.cashnet.com/IOVINE>
- Select the software license(s) you would like to purchase by clicking “View Details” or the software title, and make your purchase.
- You will receive an order confirmation receipt at the email address you provided.
- You will be notified by email when the software license has been activated.

If you have any questions about this process, please do not hesitate to contact Academy IT Support at iyahelp@usc.edu.

Iovine and Young Hall Cleanout

The Academy is unable to store student projects and materials beyond the end of the semester. Students must remove all projects and personal materials from the Creators Studio, lockers/locker room, and other classrooms by the end of each semester. **All projects and materials left in Iovine and Young Hall will be discarded the day after final exams end. No exceptions.**

Grading Scale

The following shows the grading scale to be used to determine the final course 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

Course Grading Breakdown

Assignments	30%
Participation and Labs	30%
Major Project	40%
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<i>Total</i>	<i>100%</i>

Group Project Milestone Due Dates (Note: subject to change before W5)

Week 10	Proposal
Week 12	Design concepts, Initial Database
Week 14	Content Build, Primary Data Population
Week 15	Beta Build
Week 16	Final Technical Build

Course Structure

Students are expected to:

- Participate in lecture discussions and critiques
- Complete weekly lab assignments and projects
- Manage and complete individual class projects
- Contribute to the group project

Students are responsible for completing assignments and projects by stated deadlines. Most assignments will be uploaded by students to their server space and linked from a self-maintained assignment page.

Course Policies

Individual student assignments and labs are expected to be completed by the individual student. While peers are encouraged to help each other, completed work needs to be the sole work of the student and should not include code written by other students, from web resources or artificial intelligence agents without clear citation. When in doubt it is best to ask the instructor and grader.

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. In most instances students will “post” their work to their assigned server 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 once you have posted the lab or assignment after the due date or you will not receive credit.

The Academy maintains rigorous academic standards for its students and on-time attendance at all class meetings is expected. Students cannot participate in class if they are not present, engaged and on-time, and accordingly points will be deducted for absences and tardies. 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.

Attendance will be conducted through a verbal role call or circulated attendance sheet at the start of lecture. You must respond or sign in to receive lecture attendance credit.

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. Additionally, students who need accommodations for religious observations should provide advanced notice to instructors and student athletes should provide Travel Request Letters. All accommodations remain at the discretion of the instructor, and appropriate documentation may be required.

Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or “recycle” work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

Academic dishonesty has a far-reaching impact and is considered a serious offense against the university. Violations will result in a grade penalty, such as a failing grade on the assignment or in the course, and disciplinary action from the university itself, such as suspension or even expulsion.

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment or what information requires citation and/or attribution.

Course Schedule: A Weekly Breakdown

Week 1a	Jan 14	Course introduction. What is data, data literacy? Why is data important? Data vs Information vs Knowledge. Information textual results versus data visualization
Week 1b	Jan 16	Extracting information from data Individual Lab: Set up directories and permissions, upload image (due W2a) Group Assignment: Information from data (due W2a)
Week 2a	Jan 21	Publishing information to the web: Basic HTML, CSS Assignment: Webpage (due W3a)
Week 2b	Jan 23	Stylesheet, css review.
Week 3a	Jan 28	Publishing data grids, introduction to tables. Assignment: Data page (due 4a)
Week 3b	Jan 30	Flex model, frameworks
Week 4a	Feb 04	Introduction to dynamic html, jQuery Lab: jQuery exercises Assignment: Interactive page (due W5a)
Week 4b	Feb 06	jQuery (con't)
Week 5a	Feb 11	Adding interactivity (sorting, filtering) to web data Assignment: Interactive data page (due W6a)
Week 5b	Feb 13	Animating data, information. Lab: Web animation (due W6a)
Week 6a	Feb 18	Web-based data structures. Dashboards. Assignment: Data dashboard page (due W7a)
Week 6b	Feb 20	Flowing JSON data into web pages
Week 7a	Feb 25	Introduction to normalized databases
Week 7b	Feb 27	Introduction to Structured Query Language (SQL) Lab: SQL exercises (due W8a)

Week 8a	Mar 04	Views, aggregate sql Assignment: SQL and php page (due W9a)
Week 8b	Mar 06	Overview of php, query-related commands, output loops. Converting db output to json.
Week 9a	Mar 11	Introduction to data visualization, charts, automated data visualizations. History of information design. Assignment: Data viz (due W10a)
Week 9b	Mar 13	Information design fundamentals, graphic design and color in data visualizations Project: Proposal (due 10a)
	<i>Mar 18, 20</i>	<i>Spring Recess</i>
Week 10a	Mar 25	Proposal presentations, feedback. Project: Initial Designs, Database (due 12a)
Week 10b	Mar 27	Introduction to data analytics Overview of using data: definitions and goals
Week 11a	Apr 01	Business Intelligence
Week 11b	Apr 03	Data in IoT devices, physical computing
Week 12a	Apr 08	Group Project design, database critiques Project: Content Build, Database Population (due 14a)
Week 12b	Apr 10	Group Project design, database critiques (con't)
Week 13a	Apr 15	Data in Machine Learning
Week 13b	Apr 17	Data Simulations
Week 14a	Apr 22	Using JS chart plug-ins. Creating data APIs. Iterating over data. Project: Beta build (due 15b) Project: Final build (due W16)
Week 14b	Apr 24	TBA
Week 15a	Apr 29	Survey of database systems, modeling options. Data warehousing, data mining, business intelligence system

Week 15b	May 01	Data mining, business intelligence systems
	Apr 26	GROUP Project Beta Build posted by 11:59pm
	May 08	<i>Student Presentations of Group Projects</i> Projects final builds due by 11:59pm

Statement on University Academic and Support Systems

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. [The Office of Student Accessibility Services \(OSAS\)](#) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Student Financial Aid and Satisfactory Academic Progress:

To be eligible for certain kinds of financial aid, students are required to maintain Satisfactory Academic Progress (SAP) toward their degree objectives. Visit the [Financial Aid Office webpage](#) for [undergraduate](#)- and [graduate-level](#) SAP eligibility requirements and the appeals process.

Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline consists of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-2500

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

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

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) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.