USC Iovine and Young Academy
Arts, Technology and the Business of Innovation

Acad274: Designing Interactive Data Systems

4 units
Fall 2026
Tuesdays and Thursdays 2 – 3:50 p.m. in IYH210

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:
M 2 - 3pm (zoom)
M 9 - 10pm (zoom with assistant)
T 11:30am - Noon (IYH210)
T 1:30 - 2pm (IYH210)
W 3 - 4pm (zoom)
W 9 - 10pm (zoom with assistant)
Th 11:30am - Noon (IYH210)
Th 1:30 - 2pm (IYH210)
And additional individual hours by appointment.

IT Help: https://uscedu.sharepoint.com/sites/IYAStudent/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 Objectives

At the conclusion of the course students will have built full-stack, data-driven web site that include interactive data systems which 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 design and build interactive, web-based applications that are driven by data feeds from a back-end database, with interactive user experiences enabled by javascript. This provides students hands-on experience with both front-end and back-end development and interactive development, with a stress on front-end design, development, and ux.

The course will introduce students to foundations in four distinct (but interrelated) areas: 1) back-end data structures and storage, querying and retrieving data (including general database/structure theory), 2) data analysis and visualization, 3) user interactivity design, and 4) interactive web scripting.

Students will use both provided data structures and databases and ones they design and implement. They 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.

Students will also be exposed to artificial intelligence concepts related to AI-code, current AI dev industry practices, and the advantages and drawbacks of using ai-generated designs and code.

Learning Objectives

Upon successful completion of the course students will have:

- Acquired a hands-on knowledge of front-end web technologies (html, css and javascript)
- Gained a working knowledge of relational database and SQL
- Get experience building and querying data structures
- Obtained a basic understanding of information design and data visualization
- Gained a foundational knowledge of web scripting, front-end and back-end
- Obtained a (group) portfolio item that features full-stack development, data insights and analysis, and an early-stage version of an 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	$75 2025–2026 annual license (active through July 2026)

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%
Total	*100%*

Group Project

The group project consists of a full-stack web application that consists of a database-driven back-end with json feeds, html and css front-end, an interactive ux driven by javsacript, and original data visualizations.

Student groups are formed with a team of 4 – 6 students and are put together by the instructor based on a self-skill survey students will fill out by Week 6. Student groups will research and pitch three possible data-driven topics for a group project. Projects web sites will have a back-end based on imported public datasets (from government, non-profit and other sources) and will feature data conclusions, interactive visualizations, and scripted narrative components.

Each milestone has multiple requirements, and student groups will be required to present the Proposal, Milestone 1 and the Final Build in class for peer and faculty + industry critiques.

The breakdown of milestones and points are listed below. At the end of the semester students will fill out both self evaluations and peer evaluations. For each milestone students will list which components they contributed to. After all of the project milestone grading the instructor will review all of the student contributions and evaluate if individual students receive full credit, reduced credit, or increase credit (extra credit) based on their contributions.

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

Week 10	5%	Proposal

Week 12	7.5%	Milestone 1: Design concepts, Initial Database
Week 14	12.5%	Milestone 2: Content Build, Primary Data Population
Week 15	25%	Milestone3: Alpha Build
Week 16	50%	Final Build

Assignment Submission Policy

Unless otherwise noted, labs and assignments are submitted through the Brightspace course site. For web-based assignments you will submit a (text) url to the running code/pages from your space on the class server.

Course Structure

Students are expected to:

- Attend and 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.

Attendance

The Academy maintains rigorous academic standards for its students and on-time attendance at all class meetings is expected. Attendance and participation in class has an impact on the "Participation" portion of your grade (see above for grade breakdown). Tardiness to class reduces credit for attendance and participation for that session.

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.

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.

Unless students provide an accommodation letter from USC's Office of Student Accessibility Services (OSAS) or a letter from IYA Student Services detailing visa or travel restrictions, attendance and active participation is expected in the classroom. Any student with such accommodations should submit their accommodation document to the instructor as soon as possible to discuss appropriate accommodations.

Students who are experiencing illness should not attend class in person. Please inform the instructor in advance of any class sessions that you can't attend for medical reasons, and accommodations will be arranged to view recorded lectures and submit alternatives to any missed class participation. Students will not be penalized for not attending class in person under these circumstances.

Use of AI Generated Code in the course

If you use include code written by AI Generators you must fully disclose that in your submission.

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

Some labs and assignments will be flagged as "AI Restricted". For these assignments if you use AI code you must submit TWO versions, the initial draft that you wrote completely yourself and the final (AI-augmented) version. Failure to submit a pre-AI version on "AI Restricted" submissions will result in zero credit.

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 contrary to this fundamental mission and includes any act of dishonesty in the submission of academic work (either in draft or final form), as well as 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. Students are expected to uphold the highest standards of academic integrity in all coursework.

This course follows 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. Students 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 academic misconduct will be reported to the Office of Academic Integrity.

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, such as suspension or expulsion.

For more information about academic integrity see the Student Handbook, 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 Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. (Living our Unifying Values: The USC Student Handbook, page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relation to the class, whether obtained in class, via email, on the internet, or via any other media. Distributing course material without the instructor's permission will be presumed to be an intentional act to facilitate or enable academic dishonestly and is strictly prohibited. (Living our Unifying Values: The USC Student Handbook, page 13).

Course Schedule: A Weekly Breakdown

Week 1a Aug 25 Course introduction. What is data, data literacy?

		Why is data important? Data vs Information vs Knowledge. Information textual results versus data visualization *Group activity:* Topic research and presentations
Week 1b	Aug 27	Extracting information from data ***Lab:*** Set up directories and permissions, upload image (due W2a) ***Lab*:** Information from data (due W2a)
Week 2a	Sep 01	Publishing information to the web: Basic HTML, CSS **Assignment:** Information/Knowledge webpage (due W3a)
Week 2b	Sep 03	Html review. Stylesheets and css.
Week 3a	Sep 08	Publishing data grids, introduction to tables. **Assignment:** Data page (due 4a)
Week 3b	Sep 10	Flex model, frameworks
Week 4a	Sep 15	Introduction to dynamic html, jQuery **Lab:** jQuery exercises (due W4b)
Week 4b	Sep 17	jQuery (con't) **Assignment:** Interactive page (due W5a)
Week 5a	Sep 22	Introduction to data models, databases **Assignment:** Information min-site (due W6a)
Week 5b	Sep 24	Introduction to Structured Query Language (SQL), querying database
Week 6a	Sep 29	Intro to back-end scripting workflow and using php code snippets in page, exploration of functionality in back-end code snippets, Outputting two queries into a page. **Lab:** Movie data page (in-class lab, due W6b)
Week 6b	Oct 01	Review SQL, MySQL database platform. Introduction to aggregate sql **Assignment:** Statistics page from php/db (due W7a)

Week 7a	Oct 06	Class cancelled
	Oct 08	*Fall Recess (no class)*
Week 8a	Oct 13	*Student skill surveys* Aggregate SQL review, creating stats demo / workshop Academy technical courses and paths
Week 8b	Oct 15	Combining sql, php, javascript in a page. Creating a dashboard ***Lab:*** Medical data dashboard (due W9a)
Week 9a	Oct 20	Animating front-end data, information *(listed as 8a)* Project Groups, Proposals and Pitches Group Working Session ***Lab:*** Animated presentation (due end of week 9) **Project:** Three Research and Proposals (due 10a)
Week 9b	Oct 22	Web-based data structures, Flowing JSON data into pages *(listed as 9a)* Group Working Session
Week 10a	Oct 27	Proposal presentations, feedback. **Project Milestone1:** Initial Designs, Database (due 12a)
Week 10b	Oct 29	Reviewing requirements for M1. Feedback and recommendations for each group topic, data. Introduction to source control, github Introduction to data visualization, generating charts from data. SQL GROUP BY ***Lab:*** three charts from data (due W11a)
Week 11a	Nov 03	Using JS chart plug-ins. Data exercise 1: Scraping/pasting data into spreadsheets, importing into database tables Group topic and data workshops with instructor
Weel 11b	Nov 05	Data in IoT devices, physical computing Data Exercise: Creating database user accounts, views, statistical views

		Group Project Lab: Prepare Mural Design Boards for 11/10
Week 12a	Nov 10	Design Critiques (M1) **Lab:** Student design critiques/feedback (due W12b) **Project Milestone 2:** Content Build, Data Visualizations, Full database Population (due 14a)
Week 12b	Nov 12	Making databases Editable
Week 13a	Nov 17	Converting db output to json with php. Creating data APIs.
Week 13b	Nov 19	Looping through json data to generate front-end data grids/tables and charts ***Lab:*** Two individual visualizations from project data (due beginning of W14)
Week 14a	Nov 24	Flowing JSON data into chart libraries for rendering. Examples, pros and cons of using ai-generated code. Milestone 2, 3 and Final Build review. Group meetings **Project Milestone 3**: Alpha site (due end of W15) **Project Final Build** (due W17a)
	Nov 26	Thanksgiving Break (no class)
Week 14b	Apr 23	Exploration of M2 design, code elements Creating data feeds that support filters, sorting
Week 15a	Dec 01	Introduction to machine intelligence, augmented intelligence Review of back-end code, db queries, data feeds. Planning out, scripting a web-based, narrative story
Week 15b	Dec 03	Use of generative ai. Course wrap up, next steps in various related areas
	DUE: GROUP Project Alpha Site (M3) posted by 11:59pm	
Week 16	Dec 10	*Student Presentations of Group Projects from 2 to 3:50pm* **DUE: Projects final builds posted by 11:59pm on 12/10**

Important University Dates for Fall 2026 Semester (Registration Calendar)

August 17-21	Registration for fall semester continues.
August 21	Last day to register and settle without late fee for session 001.
August 24	Fall semester classes begin.
September 7	Labor Day, university holiday.
September 11	For courses in session 001: • Last day to register. • Last day to receive a refund. • Last day to enroll for a grade of Pass/No Pass or Audit. • Last day to purchase or waive Tuition Refund Insurance.
September 15	Last day to add/drop a Monday-only class without a mark of "W" and receive a refund, or change Monday-only class to Pass/No Pass or Audit for session 001.
October 8-9	Fall Recess.
October 9	For courses in session 001: • Last day to change Pass/No Pass to a Letter Grade. • Last day to drop a course without a mark of "W" on the transcript.
November 11	Veterans Day, non-instructional day.
November 13	Last day to withdraw a course for session 001.
November 25-29	Thanksgiving holiday.
December 4	Fall semester classes end.
December 5-8	Study days.
December 9-16	Final Exams.
December 9-22	Final grade submission via Grading and Roster system, session 001.

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.

CARE-SC: Confidential Advocacy, Resources, and Education Support Center - (213) 740-9355(WELL) – 24/7/365 on call.
Confidential advocates, prevention educators, and professional counseling teams work to promote a universal culture of consent, as well as prevent and respond to sexual assault, intimate partner violence, stalking, or other relationship harm. Services available to all USC students at no cost.

Office of Civil Rights Compliance - (213) 740-5086
Information about how to get help or help someone affected by harassment, discrimination, retaliation on the basis of a protected characteristic, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

USC Report & Response - (213) 740-2500
The USC Report & Response website is the university's central reporting portal for concerns arising in the academic space or workplace. All concerns will be assessed and referred to the appropriate university office for resolution. Any questions about USC Report & Response or reporting, in general, can be referred to the Office of Professionalism and Ethics at ope@usc.edu.

USC Campus Support and Intervention - (213) 740-0411
Focuses on student success by assisting students in navigating and resolving complex issues through problem solving, presenting options, and connecting to resources.

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.