

Information Exposition

INFO 3402; Spring 2021

Monday, Wednesday, Friday; 11:30–12:20

Zoom room: <https://cuboulder.zoom.us/j/91984080043>

Abram Handler

Instructor, Information Science

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Office hours: Wednesdays, 10:30–11:30

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Office hours: Fridays, 12:30–14:00

Course Description

This course prepares students to interpret data and to communicate their findings to a general audience by designing content for the web. Students will learn to develop and analyze web sites using technologies like HTML, CSS, JavaScript, and web scraping. In addition to these technical skills, students will also think critically about the empirical limitations, social implications, and ethical consequences of data science from examples introduced throughout the class. Students will finish the class with professional-looking websites containing a portfolio of their previous and on-going projects.

Learning objectives

The class will focus on developing both students' technical and expository skills. On the technical side, students will begin to develop with modern web technologies like [Markdown](#), [HTML](#), [CSS](#), [JavaScript](#), [HTTP](#) and [web scraping](#). On the expository side, students will learn to interpret data, identify threats and limitations, and develop a practice of responsibly critiquing others' work. Thus students will:

- Master technical skills to develop and to communicate with web technologies
- Learn to communicate technical ideas to different audiences across different media
- Develop a practice of peer-reviewed feedback to improve others' projects
- Learn to think critically about empirical claims based on data

Course Design

Class will meet three times per week on Monday, Wednesday, and Friday from 11:30 to 12:20 in Zoom. CU Boulder is on a modified schedule for Spring 2021 because of the lack of a Spring Break: there are several weeks when no classes will be held in addition to holidays. We will use a “synchronous remote” instructional model: students will attend class on Zoom at the scheduled time. *Attendance is required.* During class expect to participate in discussions, help your peers improve their ability to communicate about data and be ready

to analyze and evaluate empirical conclusions. Participation in these activities is a big part of your grade in this class.

In order to fully participate remotely, students will need access to a personal computer with a web camera and a reliable high-speed internet connection. Students should be professional and engaged while on Zoom. Please arrive on time, [ensure your mic and video are working](#) before class, dress appropriately and have a background appropriate for a university class, and refrain from side activities and conversations in or outside of Zoom. Students who violate these norms or otherwise disrupt class will be warned once and then removed and lose the day's participation credit. We will discuss, debug, and develop practices about how best to run a synchronous remote instructional model and are open to feedback and iteration throughout the semester.

We will use several different mediums for exposition including web pages, interactive presentations, GitHub repositories, and Jupyter Notebooks. Students are expected to learn to explain empirical conclusions based on data using each of these expository techniques. During lectures we will learn and practical technical expository skills, analyze empirical conclusions based on data, and offer feedback and suggestions to help others communicate more clearly about the analysis of information. There will be Weekly Assignments, but no midterm, final exam, or final project.

Requirements and contingencies for COVID-19

This class will be remote throughout the semester. We will be meeting at this Zoom link:

<https://cuboulder.zoom.us/j/91984080043>

Should a student contract any illness that requires mandatory sequestration, intensive medical treatment, or extended convalescence and disrupts their ability to participate in class and complete assignments, the instructors will try to accommodate their condition without penalty with extensions and incompletes. This also applies if the student has a family member whose diagnosis, treatment, and recovery will affect their ability to participate. *Please do not ghost us:* students should notify the instructors as soon as possible of events that will impact their engagement with the class so that we can triage and develop an accommodation plan rather than scrambling to solve problems near deadlines at the end of the semester.

Outside of class, as matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease.

Prerequisites

Students should have completed INFO 2201 and INFO 2301 or similar coursework covering intermediate computational reasoning and intermediate statistical reasoning before enrolling in INFO 3402. If you have questions about these prerequisites, please email the instructors.

Requirements

Students' regular and sustained participation in all class activities as well as punctual and thorough completion of assignments are essential. If you need to be excused from attending a class session or need an extension to an assignment, please email instructors at least 24 hours in advance.

Course Website and Materials

There is no textbook required for class, but there will be required readings, tutorials, and other material, which will be made available through Canvas:

<https://canvas.colorado.edu/courses/70121>

Once the semester begins, this PDF version of the syllabus will be revised infrequently and any revised requirements will be posted as announcements and updated course schedule to Canvas. The instructors reserve

the right to make changes to the course's schedule, evaluation criteria, policies, *etc.* through announcements in class and on Canvas, so please check Canvas regularly. Students should email the instructors if there are any discrepancies or questions.

Statistical Computing

Students will need to use statistical computing software. [Jupyter notebooks](#) written in Python 3 will be used for all in-class examples and assignments. The [Anaconda distribution](#) of Python 3.8 (or above) is *strongly* recommended to provide all of these programs and other libraries. Lectures will include exercises and presentations with the expectation that students participate with their own laptop computers. If students cannot bring a laptop to class, they should email the instructors to work out an alternative arrangement. If students wish to use an alternative data analysis environment (R, Matlab, Julia, *etc.*) they are welcome to do so, but instructional support will only be provided for Anaconda and Python.

Evaluation

Students will be evaluated through two different mechanisms.

Weekly Assignments (60%). Weekly Assignments are intended to develop students' skill and confidence applying the technical and expository skills introduced during lecture. There will be a total of 15 Weekly Assignments. Each Weekly Assignment is worth 4% of the final grade (60% cumulative) and are due on Canvas by the subsequent Friday before midnight. The format and evaluation criteria of each Weekly Assignment will vary but we will provide a rubric available on Canvas. We will employ a peer reviewing model in which students are responsible for using the rubric to evaluate and provide feedback. These peer reviews will be randomized and anonymous through Canvas. The instructors will audit these peer reviews; if a peer reviewer's evaluation is significantly deficient, the peer reviewer will lose a letter grade on their own assignment. We will discuss and iterate on the peer reviewing process throughout the semester. In the absence of an approved excuse, late submissions will be docked 2% of their value for every hour elapsed since the deadline: *assignments submitted after Sunday at 2:00 (50 hours after the deadline) will lose all credit.* The lowest Weekly Assignment grade will be automatically dropped and there are no opportunities for re-grades on assignments.

Participation (40%). Participation will be assessed on a combination of attendance and in-class engagement. Students should expect to be "cold called" to answer or present (using Zoom's screen share functionality) during class time. If a student has a disability, anxiety, or another issue that limits their ability to participate in this format, please email the instructors to work out an accommodation. Participation grades cannot be made up but students can miss up to five classes without an effect on their grade. Students who will have extended absences due to a medical condition, injury, or family emergency should contact the instructors as soon as possible to develop an accommodation plan.

Course Policies

In-Class Confidentiality

The success of this class depends on students feeling comfortable sharing questions, ideas, concerns, and confusions about assignments, work-in-progress, and their personal experiences. Students may read, comment, and run classmates' writing, code, and other class-related content for use within this class. However, students may not use, run, copy, perform, display, distribute, modify, translate, or create derivative works of another student's work outside of this class without that student's expressed written consent or formal license. Lectures will be recorded using Zoom and posted to Canvas at the end of each class. Students may not create any audio, video, or other records of lectures without the instructor's permission nor may students publicly share comments made in class attributable to another person's identity without that person's permission.

Accommodations for Disabilities

We are committed to providing everyone the support and services needed to participate in this course. If you qualify for accommodations because of a disability, please submit your accommodation letter from Dis-

ability Services to the instructor in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the www.colorado.edu/disabilityservices/students. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see Temporary Medical Conditions under the Students tab on the Disability Services website and discuss your needs with the instructor.

Religious Observance

Campus policy regarding [religious observances](#) requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required assignments/attendance. If this applies to you, please [email the instructor](#) as soon as possible to make the appropriate accommodations.

Classroom Behavior

Students and instructors each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity and gender expression, age, ability, and nationality. Class rosters are provided to the instructor with the student's legal name. The instructor will honor your request to address you by an alternate name or gender pronoun. Please advise the instructor of this preference early in the semester so that he may make appropriate changes. For more information, see the policies on [class behavior](#) and the [student code](#).

Harassment and Discrimination

The University of Colorado Boulder is committed to maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU's [Sexual Misconduct Policy](#) prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic violence), stalking or related retaliation. CU Boulder's [Discrimination and Harassment Policy](#) prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at the [OIEC website](#).

Honor Code

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the [academic integrity policy](#) of the institution. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information can be found at honorcode.colorado.edu.

Acknowledgements

This syllabus was typeset in L^AT_EX using [Overleaf](#) with the [fbb/Bembo](#) font and is derived from the memoir styles adapted by [Kieran Healy](#) and [Benjamin 'Mako' Hill](#).

Course Outline

Please consult the schedule online at Canvas for the most up-to-date information.

Week 1 – Introduction

Friday, January 15

Introductions, course overview, core software. **Weekly Assignment 1 due Friday, January 22.**

Week 2 –Documentation

Wednesday, January 20; Friday, January 22

NOTE: *No class on Monday, January 18 due to Martin Luther King, Jr. Day.*

Markdown and documentation best practices. **Weekly Assignment 2 due Friday, January 29.**

Week 3 – GitHub

Monday, January 25; Wednesday, January 27; Friday, January 29

GitHub to host code and websites. **Weekly Assignment 3 due Friday, February 5.**

Week 4 – HTML I

Monday, February 1; Wednesday, February 3; Friday, February 5

HTML documents, tags, and editing. **Weekly Assignment 4 due Friday, February 12.**

Week 5 – HTML II

Monday, February 8; Wednesday, February 10; Friday, February 12

Intermediate HTML for images, tables, and embeds. **Weekly Assignment 5 due Friday, February 19.**

Week 6 – HTML III

Monday, February 15; Friday, February 19

NOTE: *No class on Wednesday, February 17.*

Advanced HTML with Cascading Style Sheets (CSS). **Weekly Assignment 6 due Friday, February 26.**

Week 7 – HTML IV

Monday, February 22; Wednesday, February 24; Friday, February 26

In-class critiques of students' websites. **Weekly Assignment 7 due Friday, March 5.**

Week 8 – Javascript I

Monday, March 1; Wednesday, March 3; Friday, March 5

Basic syntax, control flow, interactive websites. **Weekly Assignment 8 due Friday, March 12.**

Week 9 – JavaScript II

Monday, March 8; Wednesday, March 10; Friday, March 12

JavaScript and Document Object Model (DOM). **Weekly Assignment 9 due Friday, March 19.**

Week 10 – Javascript III

Monday, March 15; Wednesday, March 17; Friday, March 19

Front-end web frameworks like Bootstrap. **Weekly Assignment 10 due Friday, March 26.**

Week 11 – JavaScript IV

Monday, March 22; Wednesday, March 24; Friday, March 26

Simple web presentations with Reveal.js. **Weekly Assignment 11 due Friday, April 2.**

Week 12 – JavaScript V

Monday, March 29; Wednesday, March 31; Friday, April 2

Advanced web presentations; presentation critiques. **Weekly Assignment 12 due Friday, April 9.**

Week 13 – Web Scraping I

Monday, April 5; Wednesday, April 7; Friday, April 9

HTTP, requests, and BeautifulSoup; ethics of web scraping. **Weekly Assignment 13 due Friday, April 16.**

Week 14 – Web Scraping II

Monday, April 12; Wednesday, April 14; Friday, April 16

Intermediate web scraping. **Weekly Assignment 14 due Friday, April 23.**

Week 15 – Web Scraping III

Monday, April 19; Wednesday, April 21; Friday, April 23

Scraping web APIs. **Weekly Assignment 15 due Friday, April 30.**

Week 16 – Web Scraping IV

Monday, April 26; Wednesday, April 28

NOTE: No class on Friday, April 30 due to Reading Day.

Web scraping with Selenium. **Weekly Assignment 16 due Friday, May 7.**

Topic	Week	Dates	Topics	Instructor
<i>Fundamentals</i>	1	Jan 15*	Introductions	Keegan
	2	Jan 20, Jan 22*	Documentation	Keegan
	3	Jan 25 – Jan 29	GitHub	Keegan
<i>HTML</i>	4	Feb 1 – Feb 5	Basic HTML	Handler
	5	Feb 8 – Feb 12	Intermediate HTML	Handler
	6	Feb 15, Feb 19*	Cascading style sheets (CSS)	Handler
	7	Feb 22 – Feb 26	Website critiques	Handler
<i>JavaScript</i>	8	Mar 1 – Mar 5	Basic JavaScript	Handler
	9	Mar 8 – Mar 12	Intermediate JavaScript	Handler
	10	Mar 15 – Mar 19	Frameworks with Bootstrap	Handler
	11	Mar 22 – Mar 26	Presentations with Reveal.js	Keegan
	12	Mar 29 – Apr 2	Presentation critiques	Keegan
<i>Scraping</i>	13	Apr 5 – Apr 9	Fundamentals and ethics	Keegan
	14	Apr 12 – Apr 16	Scraping with BeautifulSoup	Keegan
	15	Apr 19 – Apr 23	Scraping web APIs	Keegan
	16	Apr 26, Apr 28*	Scraping with Selenium	Keegan

* Shortened week