



## STS 115: Data & |! Stories

Winter 2023 Course Syllabus

**Lectures:** Tues & Thurs, 6:10 p.m. - 7:30 p.m. Wellman Hall 6

**Lab:** Wednesday, 6:10 p.m. - 7:00 p.m. Wellman Hall 226

**Instructor:** Alejandro Ponce de León, [poncedeleon@ucdavis.edu](mailto:poncedeleon@ucdavis.edu)

**Office hours:** Tuesdays, 4:00–6:00 p.m. (appointments, [here](#))

**Reader:** Anna Cole Crosbie, [ascolecrosbie@ucdavis.edu](mailto:ascolecrosbie@ucdavis.edu)

### Presentation

This course introduces critical data storytelling through practical engagement, group discussion, and collective reflection. We will study different strategies for finding, analyzing, and presenting data through compelling narratives and accessible visualizations. We will also reflect on contemporary economic, political, and ethical challenges in data interpretation.

“Data storytelling” has become a buzzword among analysts and recruiters across the data industry. As a craft, it combines visual and narrative methodologies to present unique patterns in data that help explain complex ideas, engage audiences, and inspire action. However, a prevailing assumption is that there is an excess of standardized data sets. Terms like 'data-mining' and 'streaming data' give the impression that data is easily accessible to whoever wants to look at it. By drawing from scholarship in critical data studies, this course argues that before data can be “narrated” or “visualized,” it needs to be produced, processed, and ordered. Data is not raw, objective, or neutral, but rather a product of complex social interactions.

Critical data storytelling is an approach to crafting stories with data that is attentive to the stories that data tells. Students in this course will learn how to communicate evidence-based insights in meaningful ways while considering the stories behind the social life of data. This course will also help students build computational skills for data analysis and presentation. Specifically, the course introduces elementary aspects of the R computing language to explain data analysis and storytelling concepts. Previous experience with R or statistical analysis is not a prerequisite.

### Assignments & Assessments

The course develops through a combination of lectures, lab activities, research reports, in-class discussions, and oral presentations. We will meet three times a week. Unless stated otherwise, Tuesday lecture sessions will introduce students to scholarship in the field of critical data studies. Wednesday lab sessions will focus on *Data exploration* activities. On Thursdays, we will have in-class discussions and oral presentations. Below you will find a general overview of the

assignments, homework, readings, and course activities. I will post detailed guidelines per assignment on Canvas.

Success will depend on our collective engagement with the course content. Assignments will revolve around the *Data Storytelling Project*, a quarter-long research endeavor where students collaborate in groups to study a specific topic, propose sociotechnical questions about a concrete dataset, and craft visual and narrative data stories. The *Data Storytelling Project* comprises practical and reflexive assignments while providing an excellent opportunity for students to learn from each other and improve their communication skills.

We will engage with a variety of readings and media which will help us think about data beyond its technical dimensions. Before each lecture, students should complete all assigned readings –or listen to assigned podcast episodes. Expect to spend three to four hours per week preparing your course materials, as they are all ‘testable’—they may appear in whole or in part in future assignments. While most group assignments can be completed individually or during lecture sessions or lab time, I advise students to communicate with peers about time availability and prior commitments.

Finally, please be aware that we may be discussing topics deemed delicate. At times, the content of the course may surprise or provoke you. You may also be confronted with thoughts or opinions that differ from your values, ideas, or experiences. For this reason, I encourage us to think together about how ideas can move us differently. I invite you to debate politely and intelligently, always trying to assume positive intent in others. This does not mean that we need to agree with one another, but it pushes us to ask questions that help us better understand how our unique experiences, values, and reasoning shape our thinking.

#### Grading criteria

<i>Data explorations (3pts. each)</i>	<i>24 pts</i>
<i>Story reports (3pts. each)</i>	<i>24 pts</i>
<i>Book review</i>	<i>10 pts</i>
<i>Zine</i>	<i>16 pts</i>
<i>Final presentation</i>	<i>16 pts</i>
<i>Participation &amp; engagement</i>	<i>10 pts</i>

*For a total of 100 points (100% of your final grade)*

#### *Data explorations (24 pts)*

Data exploration assignments will walk you through technical skills in finding, organizing, analyzing, and presenting data in R. They will also help you identify a topic, define a structure, and critically engage with the dataset your group has selected for the *Data Storytelling Project*. You will work and submit these assignments individually. By the end of the quarter, you will have produced a comprehensive data exploration. Instructions for individual data exploration assignments are available

on Canvas. You will work on these assignments on Wednesdays during lab sessions, but you are not expected to complete them by the end of the session. There are eight data exploration assignments in total, each worth 3 points. Below you will find a detailed schedule for submission dates.

#### *Story reports (24 pts)*

Throughout the quarter, your group will work on a series of reports about your data stories. The purpose of these reports is for you to discuss with your peers what you found in your *Data explorations* and to decide the best ways to transform these findings into an insightful data story. I will post the guidelines and rubric for the *Story reports* to Canvas, but each group will have to decide what to include—and in what form—in their weekly *Story report*. We will have time to work in groups on this assignment on Thursdays. There are eight *Story reports* in total, and each is worth 3 points. Below you will find a detailed schedule for submission dates.

#### *Book review (10pts)*

Each student will prepare a short presentation in which they will review a book on data and/or storytelling and will lead a discussion around it. During the first week of class, I will circulate a list of possible books to review, and you will mark the one you would like to review. There will be more than one presenter per session, and this may not necessarily be the same group of students that are part of your *Data Storytelling Project*. The students presenting on a given day will collectively write a summary of the key points, arguments, and concepts presented in the book, concluding with at least five discussion questions to pose to the class. The summary and questions will be shared on Canvas the night before our meeting. Presenters will conduct the session in any manner they choose, but their facilitation should encourage thoughtful discussion about the book. This assignment aims to encourage you to study and develop effective modes of communication. It will be worth 10 points. Below you will find a detailed schedule for presentation dates.

#### *Zine (16 pts)*

In this course, we will use DIY methodologies to craft an informational zine about economic, political, or cultural issues around the dataset selected for your *Data Storytelling Project*. A zine is a small-circulation handmade mini-magazine, usually reproduced via a photocopier. This format has a long history of being an alternative to mainstream voices, representations, and ways of addressing social issues. In Critical data studies, zine-making has become a lively way to think with and against digital technologies, as zines resist the logic that can seep into data-centric publication spaces—such as reading

metrics, word count, and quantifiable ‘impact.’<sup>1</sup> The zine assignment aims to craft visual and narrative stories around data, present information graphically, be informative, and develop guiding principles and best practices for Data Justice and collective discussion. Groups will collectively decide the content and format of the zine, as well as produce and assemble it. Your zine must connect your findings and insights with the themes and topics we discuss in class. It must also contain a minimum of 12 pages of original story craft –visual and narrative–, and these may come from your *Data explorations* or *Story reports*. I encourage you to be creative while considering the storytelling principles we will discuss in class. You will submit a digital copy of your zine via Canvas on March 15<sup>th</sup>. This assignment will be worth 16 points.

#### *Final presentation (16 pts)*

This course does not have a final exam but does have a final presentation. No later than March 15<sup>th</sup>, each *Data Storytelling Project* group will submit an audio recording presenting their data story. This story may contain similar findings, insights, and arguments as those presented in your zine. You can also expand them, contrast them, or even present alternative ideas. The objective of this assignment is for you to focus on crafting a cohesive oral presentation. As we will learn in this course, stories can unfold in many ways. They also tend to have common structural elements —introduction, characters, buildup, tension, and resolution. In the audio recording, each group member will succinctly present (3-4 minutes) a segment of the story, a set of arguments, or relevant insights you gathered from your data research. This assignment will be worth 16 points.

#### *Participation & engagement (10pts)*

Students are expected to participate actively during lecture sessions. There are many ways of participating. Some of them include: discussing readings, making pertinent comments or questions, contextualizing ideas within the broader themes of the course, proposing different interpretations of the materials we are studying, making eye contact, actively listening, and nodding. I am flexible on what counts as participation, so feel free to contact me if you want to clarify expectations. On average, plan to participate once or twice per session.

If you miss a lecture session, you may not receive points for participation & engagement unless you present proper documentation. You can arrive anytime, but you may not receive points for

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<sup>1</sup> While writing this syllabus, I came across a similar assignment that is part of the course "Data Feminisms", taught by Dr. [Hina Shaikh](#) at University of Florida. Through her pedagogical work –as well as that of other feminist educators such as [Catherine D'Ignazio](#), [Alex Ketchum](#), and [Ash Watson](#)– I learned to approach Zines as critical tools of inquiry to approach data.

participation & engagement if you are more than 15 minutes late to lecture. Late arrivals are disruptive, so please try to be punctual as a gesture of courtesy. I expect students to be present and engaged, but I also understand that people may have other commitments. If you know you need to arrive late –or leave early—, please contact me before lecture and I will do my best to accommodate the situation and make sure you do not miss out on important information.

If you are not feeling well or have any symptoms consistent with COVID-19, please stay home, notify me at your earliest convenience, report your symptoms by completing the UC Davis Daily Symptom Survey, and get tested —this all counts as proper documentation. Participation and engagement will be worth 10 points.

### Late assignments

Assignments should be submitted before their stated deadline. Please reach out to me via Canvas if there are pressing reasons why you need to turn in an assignment late. Extensions will occasionally be granted. Otherwise, late assignments will receive a 10% point deduction immediately. After this, an additional 10% will be deducted for each additional day you are late. No assignment will be accepted more than one week (7 days) after the stated deadline (including weekend days).

### Grading rubric

To ensure consistency in grading, the rubric below will be used for most assignments in this course. Specific guidelines and grading criteria for each assignment will also be provided.

<i>A+ (97%-100%)</i>	<i>This applies to submissions that are exceptionally effective in style and content while extending the course content and main arguments in new and creative ways.</i>
<i>A (90%-96%)</i>	<i>This applies to submissions that followed the guidelines and, while there may be room for improvement, are evident passes.</i>
<i>B (80%-89%)</i>	<i>This applies to weak submissions that may communicate an argument or idea clearly but lack solid argumentative development or thematic command.</i>
<i>C (70%-79%)</i>	<i>This applies to unsatisfactory submissions that lack coherence or exhibit serious weaknesses.</i>
<i>D (65%-69%)</i>	<i>This applies to submissions that do not meet several of the minimum requirements.</i>
<i>F (&lt;65%)</i>	<i>This applies to submissions that do not follow the guidelines or do not demonstrate engagement or understanding of the course content.</i>

### Course material

In this course, we will read academic articles and books, listen to podcast episodes, and watch video recordings. This syllabus includes links to repositories where you can access most of the media we will

be studying<sup>2</sup>. Required readings will be available on Canvas under the folder named “readings” and organized per week. Copies of all books can be purchased from the UC Davis bookstore. If you have any problem accessing the material, please let me know as soon as possible. This course has two suggested textbooks that will help you expand the course content.

1. Duarte, Nancy. 2019. *DataStory: Explain Data and Inspire Action Through Story*. Oakton, Virginia: Ideapress Publishing.
2. Llaudet, Elena, and Kosuke Imai. 2022. *Data Analysis for Social Science: A Friendly and Practical Introduction*. Princeton: Princeton University Press.

### Computers and note-taking

The *Data exploration assignments* will require the use of the R programming language and RStudio graphical interface. These tools are free and available on all major operating systems. During the first week of class, we will assist you in installing R and RStudio on your computer. Please bring your personal computer to labs on Wednesdays. If you do not have access to a personal computer, please let me know as soon as possible. UC Davis has several computing resources, financial aid, and scholarships to help you purchase one.

Tuesday and Thursday lecture sessions do not require the use of electronic devices. As there will be a strong conversational component in these sessions, I prefer you to take notes by hand. This practice has several benefits<sup>3</sup>, but most importantly, it helps us collectively engage with the course conversation. I will provide blank notepads to students who ask for them during the first week of class.

### Communication policy

We will communicate via Canvas. Please visit the course site every week. If you have any questions, please send me a message and I will respond as soon as possible. However, allow me two business days to respond.

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<sup>2</sup> As you work on your *Data Storytelling Project*, I also invite you to consult data stories in different formats. Podcasts are excellent sources of inspiration. I recommend: [Conversations with Data](#), [Data Viz Today](#), [Loud Numbers](#), [Explore Explain](#), [Data Radicals](#), [Data Stories](#), and [The Data Journalism Podcast](#). [FlowingData](#) and [FiveThirtyEight](#) offer fantastic data explorations. Finally, explore the works of these phenomenal artists: [Giorgia Lupi](#), [Mona Chalabi](#), [xiaowei r. wang](#), and [Everest Pipkin](#).

<sup>3</sup> Research across fields suggests that writing by hand can be beneficial for learners. Studies have shown that it helps with memory and information retention –as it involves different cognitive processes than typing, which can be more effective to process new information. Other studies suggests that writing by hand leads to increased creativity and divergent thinking. In my practice, it helps me slow down my thinking and helps me focus and clear my mind –all associated with better learning experiences.

### **GE Requirements**

This course meets the Oral Skills Literacy requirement. The purpose of the Oral Skills Literacy requirement is to strengthen effective communication skills by strengthening students' ability to use critical thinking skills to present ideas or concepts verbally. To meet this GE's requirements, you will be expected to present a book review at least once in the quarter and to submit a final audio file presenting the outcome of your *Data Storytelling Project*.

### **Accommodations**

Let me know via Canvas if you need any accommodations based on a documented disability. I rely on the Student Disability Center to make accommodations, so please contact them as well. For more information, visit their website ([here](#)).

### **Plagiarism and academic integrity**

Plagiarism is presenting someone else's work (in any media) as one's own. It can occur intentionally or unintentionally. Examples of plagiarism include the lack of appropriate citations when quoting someone's work, paraphrased text that lacks a correct reference to the original source, and work copied from a peer. Your responsibility is to know and comply with all University of California policies and procedures regarding academic integrity. I will report all cases of suspected plagiarism to the Office of Student Judicial Affairs in accordance with the Code of Academic Conduct ([here](#)).

## Course Schedule

### Week 1. Introduction

Tuesday, January 10th: Course syllabus

Wednesday, January 11th: R primer

Thursday, January 12th: The Data Storytelling Project

> Dykes, Brent. 2016. "[Data Storytelling: The Essential Data Science Skill Everyone Needs.](#)" *Forbes*. March 31, 2016.

>Knaflic, Cole Nussbaumer, Host. "[What is story?](#)" *Storytelling with data podcast*. November 2017.

[Selection of groups and book review dates, due 11:59 p.m.]

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### Module One: The Social Life of Data

### Week 2. Approaches

Tuesday, January 17th: Representational and relational views

>Anderson, Chris. 2008. "[The End of Theory: The Data Deluge Makes the Scientific Method Obsolete.](#)" *Wired*, 2008.

>Bates, Jo, Yu-Wei Lin, and Paula Goodale. 2016. "[Data Journeys: Capturing the Socio-Material Constitution of Data Objects and Flows.](#)" *Big Data & Society* 3 (2).

Wednesday, January 18th: Research topic and dataset hopping

[Data exploration 1, due 04:00 p.m.]

Thursday, January 19th: Becoming a communicator of data

--[Book review](#): Lupi, Giorgia, and Stefanie Posavec. 2018.

*Observe, Collect, Dram! A Visual Journal*. New York: Princeton Architectural Press.

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### Week 3. Data worlds

Tuesday, January 24th: Infrastructure, circulation, and value

[Story report 1, due 11:59 a.m.]

>Bauer, Susanne. 2008. "[Mining Data, Gathering Variables and Recombining Information: The Flexible Architecture of Epidemiological Studies.](#)" *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 39 (4): 415–28.

Wednesday, January 25th: Data context

[Data exploration 2, due 11:59 a.m.]



Thursday, January 26th: Know your audience

- >Barker, Peter, host. “[How to harness the ‘science of storytelling’ | Will Storr.](#)” *Research Comms Podcast*. 2021.
  - [Book review](#): Storr, Will. 2021. *The Science of Storytelling: Why Stories Make Us Human and How to Tell Them Better*. New York: Harry N. Abrams.
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#### **Week 4. Data in/as/and contemporary life**

Tuesday, January 31st: Datafication and data cycles

- [Story report 2, due 11:59 a.m.]
- >Brayne, Sarah. 2017. “[Big Data Surveillance: The Case of Policing.](#)” *American Sociological Review* 82 (5): 977–1008.
- >Sadowski, Jathan. 2019. “[When Data Is Capital: Datafication, Accumulation, and Extraction.](#)” *Big Data & Society* 6 (1).

Wednesday, February 1st: Cleaning data

[Data exploration 3, due 11:59 a.m.]

Thursday, February 2nd: Crafting a data point of view

- [Book review](#): Kazakoff, Miro. 2022. *Persuading with Data: A Guide to Designing, Delivering, and Defending Your Data*. Cambridge, Massachusetts: The MIT Press.
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### **Module Two: The Ghost in the Machine**

#### **Week 5. From data to insight –or There and Back Again**

Tuesday, February 7th: Standpoint theory

- [Story report 3, due 11:59 a.m.]
- >Criado-Perez, Caroline. 2021. “Chapter 10: The Drugs Don’t Work?”. *Invisible Women: Data Bias in a World Designed for Men*. New York: Harry N. Abrams, pp. 195 – 215.
- >D’Ignazio, Catherine, and Lauren F. Klein. 2020. “[Unicorns, Janitors, Ninjas, Wizards, and Rock Stars.](#)” *Data Feminism*, MIT Press, pp. 125–48.

Wednesday, February 8th: Variation and co-variation

[Data exploration 4, due 11:59 a.m.]

Thursday, February 9th: The structure of a story arc

- [Book review](#): Hart, Jack. 2021. *Storycraft, the Complete Guide to Writing Narrative Nonfiction*. Second edition. Chicago: University of Chicago Press.
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### **Week 6. Actors**

Tuesday, February 14th: Experts, designers, and curators

[Story report 4, due 11:59 a.m.]

>Seaver, Nick. 2021. "[Seeing like an Infrastructure: Avidity and Difference in Algorithmic Recommendation.](#)" *Cultural Studies* 35 (4–5): 771–91.

Wednesday, February 15th: Quantitative insights

[Data exploration 5 due 11:59 a.m.]

Thursday, February 16th: Action through an analytical structure

--[Book review](#): Tufte, Edward R. 2006. *Beautiful Evidence*.  
Cheshire, Conn: Graphics Press.

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### **Week 7. Models, theory, and explanations**

Tuesday, February 21st: Modeling as narrative

[Story report 5, due 11:59 a.m.]

>Edwards, Paul N. 2010. "Simulation Models and Atmospheric Politics, 1960 – 1992." In *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming*. Cambridge, Mass.: The MIT Press.

Wednesday, February 22nd: (Re)contextualization

[Data exploration 6, due 11:59 a.m.]

Thursday, February 23rd: Writing observations

> O'Brien, Dave, Host. "[Metrics at Work Journalism and the Contested Meaning of Algorithms.](#)" New Books Network. September 14th, 2020.

--[Book review](#): Dykes, Brent. 2019. *Effective Data Storytelling: How to Drive Change with Data, Narrative and Visuals*. Hoboken, New Jersey: Wiley.

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## **Module Three: Pushback!**

### **Week 8. Missing and contested data**

Tuesday, February 28th: Data politics

[Story report 6, due 11:59 a.m.]

>Fortun, Kim, Lindsay Poirier, Alli Morgan, Brandon Costelloe-Kuehn, and Mike Fortun. 2016. "[Pushback: Critical Data Designers and Pollution Politics.](#)" *Big Data & Society* 3 (2): 2053951716668903.

> Cifor, M., Garcia, P., Cowan, T.L., Rault, J., Sutherland, T., Chan, A., Rode, J., Hoffmann, A.L., Salehi, N., Nakamura, L. 2019. *Feminist Data Manifest-No.*

Wednesday, March 1st: Insights and data gaps  
[Data exploration 7, due 11:59 a.m.]

Thursday, March 2nd: Humanizing data  
--Book review: Meg Bowles, Catherine Burns, Jenifer Hixson, Sarah Austin Jenness, and Kate Tellers. 2022. *How to Tell a Story: The Essential Guide to Memorable Storytelling from the Moth*. New York: Crown.

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### **Week 9. Visibilities**

Tuesday, March 7th: Art, *dataism*, and aesthetics  
[Story report 7, due 11:59 a.m.]  
>Casini, Silvia. 2021. "What Counts as Data and for Whom? The Role of the Modest Witness in Art–Science Collaboration." In *Routledge Handbook of Art, Science, and Technology Studies*. Routledge.  
>Mimi Onuoha. 2016. *The Library of Missing Datasets*

Wednesday, March 8th: Graphs and visualizations  
[Data exploration 8, due 11:59 p.m.]

Thursday, March 9th: Visual communication  
--Book review: Knaflic, Cole Nussbaumer. 2015. *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Hoboken, New Jersey: Wiley.

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### **Week 10. Data Justice and Ethics**

Tuesday, March 14th: Data matters  
[Story report 8, due 11:59 a.m.]  
>Amoore, Louise. 2020. "Politics and Ethics in the Age of Algorithms." In *Cloud Ethics, Algorithms and the Attributes of Ourselves and Others*. Durham NC: Duke University Press.  
>Taylor, Linnet. 2017. "What Is Data Justice? The Case for Connecting Digital Rights and Freedoms Globally." *Big Data & Society* 4 (2).

Wednesday, March 15th. Final review  
[Zines and Final presentations, due 11:59 p.m.]  
[No Data exploration assignments]

Thursday, March 16th. Course conclusion

**Instruction Ends: Friday, March 17<sup>th</sup>**