

# DATA 101

## Syllabus at a Glance

### Course Info

- **Professor:** Dr. Joanna Bieri (joanna\_bieri@redlands.edu)
- **Meets:** Tuesday, Thursday - 9:25-10:40am, Duke Hall 109
- **Office Hours:** vary by student need; kept current on the class website
- **Time Commitment:** minimum 4 hours outside class per hour in class (~10 hrs/week)

### Grading Breakdown

|                        |     |
|------------------------|-----|
| Pre-Class Preparation  | 10% |
| In-Class Participation | 10% |
| Homework               | 30% |
| Midterm Exams          | 30% |
| Final Project          | 20% |

→ Full grading scale and evaluation procedures

### Key Dates - Fall 2026

- Classes Begin: Tuesday, September 1
- Exam 1 (in-class): Tuesday, October 6
- No Class - Fall Break: Tuesday, October 13
- Exam 2 (in-class): Tuesday, November 3
- No Class - Thanksgiving: Thursday, November 26
- Final Exams & Final Project Presentations: December 9-12

→ Full day-by-day course schedule

### Quick Links

- Classwork Expectations
- Communication
- Academic Honesty & AI Policy
- Accommodations & Support

# DATA 101

## Introduction to Data Science

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### Professor:

Dr. Joanna Bieri

joanna\_bieri@redlands.edu

### Class:

Fall 2026

T,Th - 9:25-10:40am

Duke Hall 109

### Office Hours:

Office hours vary by student need each term and are kept current on the class website.

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### Welcome to Data Science

The goal of this course is to introduce the process and best practices of Data Science. Classes, lectures, and group interactions should be a safe learning space where each member of the community feels valued, listened to, and respected. It is the responsibility of each of us to ensure that we are lifting up our peers, breaking free from old biases, reaching across cultural or socioeconomic boundaries, and supporting each other. If at any time in the class you feel that there is something that could be done to improve your learning or your experience please let me know. I am here to lift you up and help you learn!

This course is a introduction to data science using Python with a focus on question formulation, data collection and cleaning, exploratory data analysis, data visualization, prediction and communication of results. This will include data wrangling, modeling, visualization and ethics. Emphasis on reproducible results and being a good data custodian, eg. CARE and FAIR data principles. Attendance is expected at all class meetings unless you have notified me ahead of time.

### Course Learning Objectives

By the end of the semester your work must reflect your ability to

1. Use computers to explore and wrangle data.
2. Write basic code, or update given code, to do data science projects and modeling.
3. Summarize, visualize, and analyze given data.

4. Present reproducible results of a data science project in written, oral, and graphical form.
5. Understand and implement the principles behind being a good data custodian.
6. Engage with moral issues surrounding the collection, use, and storage of data.
7. Formulate a data focused research question or research area.
8. Work in a team using good communication, version control, and code sharing techniques.
9. Have some fun exploring the data!

*What are your goals for the class?*

### Time Commitment

This class meets 2.5 hours per week. Plan to spend a minimum of 4 hours outside of class for every hour in class, roughly 10 hours per week on homework, reading, and project work, in addition to class time.

### Technology

You absolutely need access to a computer that can run Python and JupyterLab. We will install all the packages you need on the first day of class. We will use JupyterLab to do our data science programming and GitHub for version control. If all of this sounds like a foreign language - have no fear! It will all be explained in class. Homework and announcements will be posted on the class website. You submit your work by pushing it to your GitHub repository - Canvas is used only for grades and reminders, not for turning in work.

**Laptop Lending Program:** If you do not have a computer, or your computer cannot handle the programming for this course, the Data Science program has a laptop lending program that can get you a computer capable of completing all the work in this class. Contact me directly and we will get you set up.

### Textbooks

This class does not have a required textbook, optional resources and interesting reads:

- Data Science for Beginners - Free Online Resources - Cost: \$0
- Data Feminism, Catherine D'Ignazio (978-0262044004) - Cost: \$25
- Weapons of Math Destruction, Cathy O'Neil (978-0553418811) - Cost: \$33
- Invisible Women, Caroline Criado Perez (978-1419735219) - Cost \$14
- The Theory that Would Not Die, Sharon Bertsch McGrayne (978-0300188226) - Cost \$14
- Freakonomics, Levitt and Dubner (978-0063032378) - Cost \$12

### Classwork

Consistent participation and engagement are crucial to your success in the class. Please read the following carefully:

- i. **Pre-Class Preparation:** You should come to class prepared to learn. This includes completing the homework assignments and reading from the previous class, taking the pre-class

quiz, and watching any pre-class lectures available on the course website.

- ii **In-Class Participation:** In class you should be actively working on and discussing Data Science. Bring your computer and try out all the things we are learning about! We will talk about more advanced ideas in class. Missing more than 2 days of class (unexcused) will result in a 50% reduction in your In-Class Participation grade and each additional missed class will decrease your grade further
- iii **Weekly Homework:** Homework will be assigned regularly and is due each week on Sunday night at 11:59pm, ahead of our Tuesday class. Each assignment should include both working Python code where appropriate for the assignment along with a written discussions of the data and reflection of your progress. Homework is graded as pass-fail. If you fail you can resubmit the assignment once.
- iv **Exams:** There will be two midterm exams - both of which you work on in groups.
- v **Final Project:** Working in teams of 2-4 students you will complete a final data science project inspired by an area of interest to the group.

### Evaluation Procedures

There are four elements of the course which contribute to your overall grade, as follows:

|                        |     |
|------------------------|-----|
| Pre-Class Preparation  | 10% |
| In-Class Participation | 10% |
| Homework               | 30% |
| Midterm Exams          | 30% |
| Final Project          | 20% |

### How to Succeed in this Class

All work for the course will be graded according following criteria.

- Students can demonstrate pre-class preparation by coming to class prepared. This means watching all the videos, completing all required reading, and starting on the assignments or worksheets. Additionally, daily quizzes will demonstrate your preparation for class.
- Students can demonstrate in-class participation by attending every class. In addition, students should be actively involved in the discussion during class time. For some this will be active speaking, for others it will be taking notes and posting them for the class, for others it will be talking in small groups or helping with collaboration. There are lots of ways to participate, let me know how you best like to contribute!
- Each weekly homework is submitted by pushing it to your GitHub repository and graded for 10 points. See the homework prompts on the class website for specific details on each assignment. You will submit your own individual homework, but working in groups is encouraged.
- Exams will have three parts. First you will work individually on the Exam (take home - no outside help) and push your work before the start of the exam period. Then working in groups you will compare your work with your peers in the class, helping everyone in your group to get the best possible grade. After the exam period, you will work individually on the exam (take home - no outside help) and push it to your repository for grading.
- The final project is your chance to show mastery of the concepts for the class. You will propose your final project during the semester and work with your peers and professor to clearly define your goals.

### Grading Scales:

|          |           |
|----------|-----------|
| 4.0 (A)  | 95-100%   |
| 3.7 (A-) | 90-94%    |
| 3.3 (B+) | 87-89%    |
| 3.0 (B)  | 83-86%    |
| 2.7 (B-) | 80-82%    |
| 2.3 (C+) | 77-79%    |
| 2.0 (C)  | 73-76%    |
| 1.7 (C-) | 70-72%    |
| 1.3 (D+) | 67-69%    |
| 1.0 (D)  | 63-66%    |
| 0.7 (D-) | 60-62%    |
| 0.0 (F)  | below 60% |

**Please note:** According to the University Course Catalog (p. 13) 3.7 and 4.0 are reserved for “outstanding” work; 3.3 and 3.0 are both defined as “excellent,” not mediocre.

### Communication

- The most reliable way to reach me is by email. Please note that my normal working hours are 9 a.m. to 5 p.m., Monday to Friday. I do not respond to emails after 5 p.m. or on weekends, except in an emergency.
- You can make appointments with me via email. Appointments can happen in Duke 209 or on Teams.
- It is important that you communicate throughout the semester. Let me know if there are ways I can improve your learning in the class. If you are going to miss class or need an extension on the homework, the earlier you tell me the better!

## Health Protocols

- In an effort to keep the classroom community safe and healthy, please follow the guidelines outlined here:
  - Wearing a mask is voluntary.
  - Do not come to class if you feel ill or have been exposed to someone who is ill.
- In any case of the above, e-mail me directly to reconcile any class work and/or attendance issues. Please contact me if you have any concerns as to your health needs and goals for the semester.

## Academic Honesty

The University of Redlands enforces strict standards as regards academic honesty, and students may be dismissed for breaches of these standards.

In light of this, please note that:

- intentional plagiarism—i.e. piecemeal or wholesale appropriation of text from one or more printed or internet source—will result in a fail grade for the course.
- plagiarism by default—i.e. uncredited adoption of ideas from source texts due to carelessness in citation—will result in a fail grade for the project.

## Artificial Intelligence

Data science asks you to do the hard, painful, and scary work of understanding ideas. I want you to do that work, not hand it to an AI. At the same time, using AI well is part of professional data science practice. In this class, you're expected to use it the way a professional would: to help you debug and write basic code, not to think for you.

- **Your understanding is never outsourced.** The written discussion, interpretation, and reflection you submit must always be your own thinking, in your own words, on every assignment. That means explaining what your data shows, why you made a choice, and what it means - the part no tool can do for you.

- **AI is welcome for the mechanics of code:** debugging error messages, looking up syntax, or drafting basic/boilerplate code, the same way a professional data scientist would use it. Treat it like a fast, knowledgeable colleague - useful, but not a substitute for understanding what your code does.
- **Disclosure scales with how much you used.** A quick debugging question or syntax lookup needs no citation. If you copy and paste code an AI wrote for you, say so: name the tool and what it helped with in a short note on the assignment. If AI helps you understand a concept, rewrite the explanation in your own words rather than pasting it in. If you draw on a large chunk of AI-generated material, disclose that too.
- **Exams are the one AI-free zone.** The take-home, no-outside-help, individual portions of exams exist to test your own understanding without tool assistance, so no AI use there.

Using AI to bypass this - having it write your reflections or data interpretation, or submitting uncredited AI work as your own - is treated as an academic honesty violation, the same as plagiarism.

If you are still in any doubt about what constitutes plagiarism or acceptable AI use, please ask me before you hand in your work!

## Office of Equity and Title IX

In order to provide a safe and equitable learning environment for all students, faculty, and staff, discrimination, harassment, retaliation, sexual misconduct, and sexual harassment (including sexual assault, dating or domestic violence, and stalking) are not tolerated at the University of Redlands. The University prohibits unlawful discrimination or harassment (as defined in the Policy Prohibiting Discrimination, Harassment, Sexual Misconduct, and Retaliation) on the basis of age, color, race, ethnicity, national origin, ancestry, sex, marital status,

pregnancy, status as a complaining party of domestic violence, sexual orientation, gender, gender identity or expression, physical or mental disability, genetic information, religion/creed, citizenship status (except to comply with legal requirements for employment), military/veteran status, or any other characteristic protected by law. If you or someone you know has experienced or experiences any of these behaviors, know that you are not alone. You can contact the Office of Equity and Title IX for reporting options, supportive measures, and resources to support you.

Many faculty and staff at the University of Redlands are considered "Responsible Employees," which means that if you tell me about a situation involving any of the above, I must report the matter to the Office of Equity and Title IX. Although I make that report, you are in control of how you would like to proceed, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of reporting options available to you and have access to the support and resources you need.

To report an incident directly, you can:

- Contact the Interim Director of Equity & Title IX, Christopher Jones, at 909-748-8289 or [titleix@redlands.edu](mailto:titleix@redlands.edu)
- Report online at: [www.redlands.edu/titleixandequity](http://www.redlands.edu/titleixandequity)

You can also report to local law enforcement at 909-798-7681, ext. 1. If you are ever in immediate danger, please call 911 or email/text [911@redlandspolice.org](mailto:911@redlandspolice.org) if you cannot call. To reach Public Safety on campus, call 909-748-8888 or use the Rave Gaudian App

If you wish to speak to someone confidentially (meaning not connecting with the Office of Equity

and Title IX Office), you can contact the following resources:

- Campus:
  - Counseling Center: 909-748-8108 or 24-Hour Crisis Line: 909-748-8960
  - TimelyCare, 24/7 emotional support; 12 free telehealth counseling sessions
- Community:
  - Partners Against Violence, 24-hour sexual assault crisis line: 909-885-8884
  - Option House, 24-hour dating/domestic violence crisis line: 909-381-3471 Online: RAINN (sexual assault); [loveisrespect.org](http://loveisrespect.org) (dating/domestic violence)

You can also report to local law enforcement at (909) 798-7681, ext. 1. If you are ever in immediate danger, please call 911 or email/text [911@redlandspolice.org](mailto:911@redlandspolice.org) if you cannot call.

If you wish to speak to someone confidentially (meaning not connecting with the Office of Equity and Title IX Office), you can contact the following resources:

- Campus: Counseling Service: 909-748-8108 or 24-Hour Crisis Line: 909-748-8960 or Chaplain's Office: 909-748-8368
- Community: Partners Against Violence, 24-hour sexual assault crisis line: 909-885-8884
- Option House. 24-hour dating/domestic violence crisis line: 909-381-3471
- Online chat: [loveisrespect.org](http://loveisrespect.org)

For more information, visit [www.redlands.edu/titleixandequity](http://www.redlands.edu/titleixandequity)

### **Accommodations**

If you are a student with a disability requesting reasonable academic accommodations in this course, please contact Academic Support and Accessibility (ASA). ASA is located in the Student Success Center on the ground floor of the Armacost Library. You can reach the office at 909-748-8069 or [asa@redlands.edu](mailto:asa@redlands.edu). All requests for reasonable accommodations require registration with ASA in advance of need. Faculty, students, and ASA will work together regarding classroom accommodations. You are encouraged to discuss approved accommodations with your faculty. More information is available on the ASA webpage.

If there are ways that simple changes to the class could improve your learning please feel free to reach out to me directly.

### **Counseling Center**

The Counseling Center provides free and confidential mental health services, including short-term individual therapy, group therapy, single-session therapy, consultations, and urgent appointments to all students with in-person or virtual options. Our Counseling Center is committed to inclusivity and to providing a supportive space for everyone. Please call 909-748-8108 to schedule an appointment or email [counseling\\_center@redlands.edu](mailto:counseling_center@redlands.edu). If a student is in crisis, please call 909-748-8960 for the 24/7 mental health crisis line. For more information on our resources, go here. Another option for individual therapy for all students is TimelyCare, which provides virtual therapy immediately (Talk Now) or up to 12 scheduled virtual therapy sessions per year. Students can choose their therapist from a list of providers for the scheduled therapy option.

### **Conflict Resolution Center**

Experiencing a conflict? Whether it's with a friend, roommate, another member of a student organization, or faculty or staff member, conflicts happen.

Learning to navigate conflicts is important to success in virtually any field, and a vital step in being a part of a community and having healthy, meaningful relationships with others. See the Conflict Resolution Center's student resources page for more information.

### **The Care Team**

The University CARE Team exists to help provide support and resources to students that are overwhelmed, experiencing significant distress, or possibly present some risk to themselves or others. As a faculty member, I may reach out to students about whom I am concerned to talk individually, and/or refer them to the CARE Team. If you have concerns about a fellow student, consider sharing your concern with the CARE Team via their online form. This is part of who we are as a caring, proactive community where we all look out for one another. Additionally, if you feel that you or someone else needs immediate mental health support, the University has a 24/7 mental health crisis line at 909-748-8960, and the Timely Care app, which offers on-demand emotional care. Both services connect to a live, licensed counselor.

### **Additional Resources**

If you are in need of additional resources, please refer to the available programs below.

### **Book Lending Program**

The Book Lending Program is an initiative to ensure the academic success of First-Generation students (students who are the first to go to college in their families who meet a particular estimated family contribution [EFC] level). Funded through alumni donations, this program provides books and other classroom materials, when needed, for First-Generation students who could not otherwise afford to purchase them. Books are returned at the end of the course, to be used by other First-Generation students the next semester. The program works along-

side the Library and faculty members to ensure the availability of books and classroom materials. For more information, click the link above or contact [blp@redlands.edu](mailto:blp@redlands.edu).

### **Emergency Student Loans**

Student Financial Services (SFS) administers a short-term, no-interest loan fund to assist students experiencing an emergency or cash-flow problem. Except in unusual circumstances, these loans do not exceed \$200 and are billed to the student's account. Evidence of repayment ability is a prerequisite for all short-term loans made to students. Students are not eligible for more than one emergency student loan per term. Contact: [SFS@redlands.edu](mailto:SFS@redlands.edu) or x8047

### **Student Lounges**

#### **Course Schedule**

*Schedule is subject to change as we progress through the semester. You will be notified of any changes in class.*

Lounges for all students to sit, work, and eat can be found here on the University website.

### **Student Affairs Discretionary Fund**

These endowed funds in Student Affairs can be used to support student success and remove impediments that otherwise may cause the student to stop or leave school. To utilize this fund, divisional leadership should be made aware of the student in dire need of financial support. This support can be anything from personal expenses, such as utility bills, gas money, emergency trips home due to family tragedy, off-campus counseling, and other medical costs, and occasionally mental health assessment expenses. Students receive grants based on their financial need. Contact: [student\\_affairs@redlands.edu](mailto:student_affairs@redlands.edu).

### **Student Food Support Pantry**

The Student Food Support Pantry is a resource available to all established full and part-time University of Redlands students facing food insecurities. The Pantry is located on the north side of North Hall. This space is an open, no-questions-asked space with dried and canned goods, and non-perishable items, as well as seasonal fresh produce from our sustainable farm and limited refrigerated goods. Food for this distribution is provided in partnership with Feeding America Riverside and San Bernardino. It is also funded through private donations, ASUR, and the Office of Community Service Learning. For more information, please contact [SURF@redlands.edu](mailto:SURF@redlands.edu).

## Introduction to Data Science - Fall 2026

| DATE       | WEEK | DAY      | Lecture Topic                                       | Homework Due                                       | Notes                                                                               |
|------------|------|----------|-----------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------|
| 09/01/2026 | 1    | Tuesday  | Day 1: Computer Setup & What is Data Science        | Get your computer set up (GIT, Python, JupyterLab) |                                                                                     |
| 09/03/2026 | 1    | Thursday | Day 2: Hello World                                  | Submit Day1 & Day2 HW by Sunday 9/6 11:59pm        |                                                                                     |
| 09/08/2026 | 2    | Tuesday  | Day 3: Data Visualization                           |                                                    |                                                                                     |
| 09/10/2026 | 2    | Thursday | Day 4: Numerical and Categorical Data               | Submit Day3 & Day4 HW by Sunday 9/13 11:59pm       |                                                                                     |
| 09/15/2026 | 3    | Tuesday  | Day 5: Data Wrangling                               |                                                    |                                                                                     |
| 09/17/2026 | 3    | Thursday | Day 6: Data Wrangling Continued                     | Submit Day5 & Day6 HW by Sunday 9/20 11:59pm       |                                                                                     |
| 09/22/2026 | 4    | Tuesday  | Day 7: Data Wrangling - Joins                       |                                                    |                                                                                     |
| 09/24/2026 | 4    | Thursday | Day 8: Reading Data & Data Types                    | Submit Day7 & Day8 HW by Sunday 9/27 11:59pm       |                                                                                     |
| 09/29/2026 | 5    | Tuesday  | Day 9: Importing, Recoding, and Visualizing Data    | Submit Day9 HW by Sunday 10/4 11:59pm              |                                                                                     |
| 10/01/2026 | 5    | Thursday | Review Day (in class)                               |                                                    | Exam 1 handed out - work individually and submit your draft before Tuesday's class. |
| 10/06/2026 | 6    | Tuesday  | Exam 1 - Work in Groups                             | Exam 1 and Self Assessment due                     | Get initial data for your Final Project.                                            |
| 10/08/2026 | 6    | Thursday | Day 10: Effective Visualization & Data Storytelling | Submit Day10 HW by Sunday 10/11 11:59pm            |                                                                                     |
| 10/13/2026 | 7    | Tuesday  | <i>NO CLASS - Fall Break</i>                        |                                                    |                                                                                     |
| 10/15/2026 | 7    | Thursday | Day 11: Getting Data & Simpson's Paradox            | Submit Day11 HW by Sunday 10/18 11:59pm            |                                                                                     |
| 10/20/2026 | 8    | Tuesday  | Day 12: Doing Data Science & Web Scraping           |                                                    |                                                                                     |
| 10/22/2026 | 8    | Thursday | Day 13: Data Ethics                                 | Submit Day12 & Day13 HW by Sunday 10/25 11:59pm    |                                                                                     |
| 10/27/2026 | 9    | Tuesday  | Day 14: Data Ethics - Algorithmic Bias              | Submit Day14 HW by Sunday 11/1 11:59pm             |                                                                                     |

|                                                                                                                                                                                        |    |          |                                            |                                                 |                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------|--------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/29/2026                                                                                                                                                                             | 9  | Thursday | Review Day (in class)                      |                                                 | Exam 2 handed out - work individually and submit your draft before Tuesday's class.                                                                                             |
| 11/03/2026                                                                                                                                                                             | 10 | Tuesday  | Exam 2 - Work in Groups                    | Exam 2 and Self Assessment due                  | Final Project Proposals due.                                                                                                                                                    |
| 11/05/2026                                                                                                                                                                             | 10 | Thursday | Day 15: Intro to Modeling and Algorithms   | Submit Day15 HW by Sunday 11/8 11:59pm          |                                                                                                                                                                                 |
| 11/10/2026                                                                                                                                                                             | 11 | Tuesday  | Day 16: Modeling Nonlinear Relationships   |                                                 |                                                                                                                                                                                 |
| 11/12/2026                                                                                                                                                                             | 11 | Thursday | Day 17: Models with Multiple Predictors    | Submit Day16 & Day17 HW by Sunday 11/15 11:59pm |                                                                                                                                                                                 |
| 11/17/2026                                                                                                                                                                             | 12 | Tuesday  | Day 18: Classification & Categorical Data  |                                                 | Final Project Groups Assigned.                                                                                                                                                  |
| 11/19/2026                                                                                                                                                                             | 12 | Thursday | Day 19: TBA - topic motivated by the class | Submit Day18 & Day19 HW by Sunday 11/22 11:59pm |                                                                                                                                                                                 |
| 11/24/2026                                                                                                                                                                             | 13 | Tuesday  | Day 20: TBA - topic motivated by the class | Submit Day20 HW by Sunday 11/29 11:59pm         |                                                                                                                                                                                 |
| 11/26/2026                                                                                                                                                                             | 13 | Thursday | NO CLASS - Thanksgiving                    |                                                 |                                                                                                                                                                                 |
| 12/01/2026                                                                                                                                                                             | 14 | Tuesday  | Final Project Work                         |                                                 |                                                                                                                                                                                 |
| 12/03/2026                                                                                                                                                                             | 14 | Thursday | Final Project Work                         |                                                 |                                                                                                                                                                                 |
| 12/09/2026 - 12/12/2026                                                                                                                                                                |    |          | FINAL EXAMS - Final Project Presentations  | Final projects/papers due                       | Complete a full-cycle data science report with clear reproducibility, ethics discussion, and formal write-up. Final Project Presentations will be scheduled during this period. |
| Shading key: alternating bands = regular weeks   peach = exam day   pale yellow = study/reading day   pale blue = final project day   pink = no class (holiday)   purple = finals week |    |          |                                            |                                                 |                                                                                                                                                                                 |