

# Syllabus

## DATA 111 Introduction to Data Science 43074

### Fall 2024

#### Course Meeting Information

- **This course meets:**
  - **Lecture:** MoWeFr 11:00AM - 11:50AM, KA 104
  - **Lab activity:** Thurs 11:00AM - 12:50PM, BSS 313
- **Final exam:** 12/18/2024, Wednesday, 10:20PM - 12:10PM, KA 104

Please be sure to regularly check Canvas and your Cal Poly Humboldt email for course information and updates.

#### Instructor Information

- **Name:** Dr. Bethany Johnson
- **Email:** bethany.johnson@humboldt.edu (please include "DATA 111" in subject when you email me about this course)
- **Office Hours and location:** Mo 9:00AM - 9:50AM  
We 9:00AM - 9:50AM and 12:00PM - 12:50PM  
Thurs 9:00AM - 9:50AM and 1:00PM - 1:50PM  
in BSS 332 (or by appointment)

#### Course Description

**Catalog description:** This course intertwines three perspectives: inferential thinking, computational thinking, and real-world relevance. We will explore real data to understand relationships and patterns while learning critical skills in computer programming and statistical inference.

**Prerequisites:** None. The minimum grade for this course to count towards a Data Science degree is C-

#### Learning Outcomes & Competencies

**Course Learning Outcomes. Upon completion of this course, you will be able to:**

- Write correct small programs that manipulate and combine data sets and carry out iterative procedures, making use of loops, conditional statements, and functions.
- Have basic familiarity with debugging code and documentation.
- Extend a program with multiple functions so that it runs correctly with additional functionality.
- Read in a data set from a website or another source.

- Calculate and interpret specified statistics of a given dataset.
- Identify the sources of randomness in an experiment.
- Formulate a hypothesis test to address a given question.
- Given a question and an analysis, explain whether the analysis addresses the question and how the analysis could change and still address the question.
- Articulate the benefits and limits of computing technology for analyzing data and answering questions.
- Correctly generate and interpret histograms, bar charts, and scatterplots.
- Correctly make predictions using regression and classification techniques, as well as simulation
- Assess the accuracy and uncertainty of a prediction and acknowledge shortcomings of the analysis, as well as explain data science’s role in the larger context of the scientific process.

**Upon successful completion of this course, you should exhibit emerging and developing evidence of these skills:**

- Conduct statistical analyses including computing confidence intervals and performing hypothesis tests in a variety of data settings.
- Given the result of a statistical analysis from the course, form correct conclusions about a question
- Discuss basic issues of privacy, data stewardship, data ethics, including the ethical use of algorithms.

## Course Readings, Materials & Fees

- **Textbook:** Computational and Inferential Thinking: The Foundations of Data Science by Ani Adhikari, John DeNero, David Wagner.
- This book is available for free online [here](#).
- **Additional Materials:** Readings and other materials such as assignments and slides will be provided on Canvas.
- **Computer and Internet:** You will need a computer and internet access to follow along during in-class demos and activities. You may use campus computer labs and, if needed, you may borrow laptops.
- **Software needed for this course:** Access to Python. Python is free, and is available on computers in our computer labs, or can be downloaded for free to your individual computer. We will be using a cloud-based JupyterHub for this class, so installation is not completely necessary.

## Course Topics & Schedule

The schedule below is preliminary and is subject to change with fair notice. A more detailed schedule with updated information can be found on Canvas.

Week	Day	Main Topics
1	Mon Aug 26	Welcome!

	Wed Aug 28	Introduction
	Fri Aug 30	Cause and Effect
2	Mon Sept 2	<i>*Sept 2, Labor Day, no class</i>
	Wed Sept 4	Tables
	Fri Sept 6	Data Types
3	Mon Sept 9	Building Tables <i>*Deadline to add/drop</i>
	Wed Sept 11	Census
	Fri Sept 13	Charts
4	Mon Sept 16	Histograms
	Wed Sept 18	Functions
	Fri Sept 20	Groups
5	Mon Sept 23	Pivots & Joins
	Wed Sept 25	Table Examples
	Fri Sept 27	Conditionals and Iterations
6	Mon Sept 30	Chance

	Wed Oct 2	Sampling
	Fri Oct 4	Models
7	Mon Oct 7	Comparing Distributions
	Wed Oct 9	Decisions and Uncertainty
	Fri Oct 11	A/B Testing
8	Mon Oct 14	Causality
	Wed Oct 16	Examples
	Fri Oct 18	More examples
9	Mon Oct 21	Catch-up/midterm review
	Wed Oct 23	Midterm review
	<b>Thurs Oct 24</b>	<b>MIDTERM BSS 313 11AM - 12:50PM</b>
	Fri Oct 25	Confidence Intervals
10	Mon Oct 28	Interpreting Confidence
	Wed Oct 30	Center and Spread
	Fri Nov 1	The Normal Distribution

11	Mon Nov 4	Sample Means
	Wed Nov 6	Designing Experiments
	Fri Nov 8	Correlation
12	Mon Nov 11	<i>Veterans Day, no class</i>
	Wed Nov 13	Linear Regression
	Fri Nov 15	Least Squares Wrap-up
13	Mon Nov 18	Residuals
	Wed Nov 20	Regression Inference
	Fri Nov 22	Privacy
-	Mon Nov 25	<i>No class! Enjoy your Fall Break!</i>
	Wed Nov 27	<i>No class! Enjoy your Fall Break!</i>
	Fri Nov 29	<i>No class! Enjoy your Fall Break!</i>
14	Mon Dec 2	Classification
	Wed Dec 4	Classifiers
	Fri Dec 6	Updating Probabilities
15	Mon Dec 9	Case Study 1

	Wed Dec 11	Case Study 2
	Fri Dec 13	Final Review
16	<b>Final exam:</b> Wed Dec 18	

## Course Structure & Modality

- This course includes in-person meetings on-campus. Class time will include lectures, discussions, and activities. This course will also include work on Canvas, where you will find a detailed schedule, links to course materials, assignment instructions, and so on. Each week, be sure to review Canvas before class so that you are prepared for in-class work and upcoming assignments.
- This is a 4-unit course, and thus you should expect at least 180 hours of work during the semester, which equates to an average of at least 12 hours per week between in-class/instructional activities, review of materials, and completion of assignments.

*NOTE: Class meets 3 hours per week for lecture and 2 hours per week for activity, so expect at least 7 hours per week of work outside of class.*

## Assignments:

**Attendance and Participation:** Regular attendance is mandatory for this course and is vital to your success. Attending classes offers several benefits including:

1. **Active Learning:** In-class engagement promotes active learning through discussions and activities.
2. **Immediate Feedback:** Attending class allows you to seek clarification, ask questions, and get feedback.
3. **Collaborative Environment:** Interacting with your peers fosters shared knowledge and diverse perspectives.
4. **Access to Important Information:** Attending class allows you to stay up-to-date with announcements and additional resources.
5. **Building a learning community:** Attendance helps you make connections with your fellow students and build networks beyond this course.

Remember that attendance is not just about fulfilling a requirement but about taking an active role in your learning journey. Your presence and participation contribute to a rich and engaging learning environment that benefit both you and your peers. We all want you to be here!

Exceptions and Accommodations: If unforeseen circumstances prevent attendance, please communicate with me *as soon as possible* to discuss options.

**Exams:** There will be two in-class exams, the last being the final exam. A study guide and details for each exam will be provided in class and on Canvas.

**Homework:** Weekly problem sets will be assigned and collected through a file upload on Canvas. Your lowest homework score will be dropped.

**Lab Activities:** Weekly lab reports will be assigned and collected through a file upload on Canvas. Your lowest score will be dropped.

**Projects:** Three projects will be assigned to allow you to showcase multiple acquired skills from the class.

**Reading:** All students are expected to read the assigned sections of the text each week.

**Notes:**

- If you have problems submitting any assignments on Canvas, contact Canvas 24/7 Support (help button in Canvas) or the Cal Poly Humboldt Help Desk (help@humboldt.edu or 707-826-4357).
- This class includes assignments that will be submitted online outside of Canvas; however, faculty review of your work will not be done publicly. If assignments ask you to submit work in a public space that is visible to people outside of the course, please contact the instructor if you would like to discuss alternative options.

**Grading & Evaluation:**

Assignment Category	% Course Grade
Homework	20%
Lab activities	20%
Projects	30%
Midterm	10%
Final	20%

**You will earn a grade in this course based on the following scale:**

- **A** = 93% or above; **A-** = 92.9-90%
- **B+** = 89.9-87%; **B** = 86.9-83%; **B-** = 82.9-80%
- **C+** = 79.9-77%; **C** = 76.9-73%; **C-** = 72.9-70%
- **D+** = 69.9-67%; **D** = 66.9-60%; **F** = <60%.
- For **CR/NC**, 70% or above is needed to pass

## Late / Make-Up Policy

If you have an emergency, please notify me immediately if this affects your coursework or attendance. Late work will be accepted only with a serious and compelling reason and documentation. I will ask you to work with the CARE office in this situation. Their information is here:

<https://deanofstudents.humboldt.edu/CARE>.

For help documenting or receiving services for serious, confidential, or ongoing circumstances, please contact the Dean of Students office <https://deanofstudents.humboldt.edu>

## Policies, Procedures, and Resources

- **Positive Learning Environment:** It is essential that we create a positive learning environment in which we are all respectful of one another. You should not hesitate to ask questions nor feel embarrassed when you get the wrong answer. We all come from different backgrounds and have different learning styles. **We learn most through trying, puzzling, struggling and making mistakes.** You are a very important part of the class, and your ideas, questions, and mistakes help us all. We can help each other solve problems, stay on schedule and be motivated. Math is way more fun in a group!
  - **Inclusivity:** Students in this class are encouraged to speak up and participate in class and on assignments outside of class. Each of us must show respect for each other because our class represents a diversity of beliefs, backgrounds, and experiences. I believe that this is what will enrich all of our experiences together. I recognize that our individual differences can deepen our understanding of one another and the world around us, rather than divide us. In this class, people of all ethnicities, genders and gender identities, religions, ages, sexual orientations, disabilities, socioeconomic backgrounds, regions, and nationalities are strongly encouraged to share their rich array of perspectives and experiences. If you feel your differences may in some way isolate you from our classroom community or if you have a specific need, please speak with me early in the semester so that we can work together to help you become an active and engaged member of our class and community.
  - **Expectations of the Student**
    - Log into the Canvas frequently. Attend class regularly. Schedule regular time to work on assignments, read the text, and study.
    - Prepare to the best of your ability for every aspect of this course.
    - Take the opportunity to learn how to write your own thoughts and code; don't plagiarize. Be sure to give credit where credit is due and cite your sources or use footnotes or endnotes. In particular, do not post material or take solutions from Chegg or Course Hero or copy code from classmates.
    - Learning through collaboration (defined as working with or learning from another) is an effective tool used in this class and in your future employment. Collaboration on assignments is encouraged, writing individual code, solutions and lab reports is required.



- **Expectations of the Instructor** If we all live up to our academic responsibilities, this course will be meaningful for all who participate. Please feel free to discuss these points with me at any time during the course this semester.
  - I will prepare and review course materials to be as current and accurate as possible.
  - I will be available to answer questions or issues that may arise for you during this course. Expect a 48-hour turnaround time for response to emails during the work week. I do not always read and reply to emails in the evening or on the weekends or holidays.
  - I will try to the best of my ability to prepare you for the exams and other assessments in this course.
  - I will utilize fair and honest evaluation techniques for each assignment required for this course.
  - To the best of my ability, I will make this a valid and worthwhile learning experience.
  - I will do my best to address the needs of a diverse range of learning styles in this course.
- **Emergency Procedures:** Review the evacuation plan and emergency procedures for the classroom. During an emergency, information can be found on campus conditions at 707-826-INFO or the [HSU Emergency website](#).
- **Academic Honesty:** Students are responsible for knowing policy regarding academic honesty. For more information, visit: [Academic Honesty Policy](#)
- **Students with Disabilities:** Persons who wish to request disability-related accommodations should contact me immediately so I can assist you in a timely manner. If you have not yet done so, please request services with the Student Disability Resource Center in the Learning Commons, Lower Library, 826-4678 (voice) or 826-5392 (TDD). Some accommodations may take up to several weeks to arrange. [Student Disability Resource Center](#).
- **Add/Drop Policy:** Students are responsible for knowing the [University policy, procedures, and schedule](#) for dropping or adding classes. The deadline for students to change their course schedule without penalty, known as the Add/Drop date is 11:59 p.m. on the Monday after the second week of classes of the regular semester term. After the deadline, approval to add or drop a class requires approval of a documented serious and compelling reason. See the [Resolution on Decoupling Drop/Add Dates from Census](#) (22-14/15-APC), [registration help](#) and [withdrawal process](#) for additional information.
- **Attendance and Disruptive Behavior:** Students are responsible for knowing policy regarding attendance and disruptive behavior: [Class Attendance and Disruptive Behavior](#).
- **Inclusivity:** Students in this class are encouraged to speak up and participate in class and on assignments outside of class. Each of us must show respect for each other because our class represents a diversity of beliefs, backgrounds, and experiences. I believe that this is what will enrich all of our experiences together. I recognize that our individual differences can deepen our understanding of one another and the world around us, rather than divide us. In this class, people of all ethnicities, genders and gender identities, religions, ages, sexual orientations, disabilities, socioeconomic backgrounds, regions, and nationalities are strongly encouraged to share their rich array of perspectives and experiences. If you feel your differences may in some way isolate you from our classroom community or if you have a specific need, please speak with me early in the semester so that we can work together to help you become an active and engaged member of our class and community.
- **Expectations of the Student**

1. Log into the Canvas frequently. Attend class regularly. Schedule regular time to work on assignments, read the text, and study.
  2. Prepare to the best of your ability for every aspect of this course.
  3. Take the opportunity to learn how to write your own thoughts and code; don't plagiarize. Be sure to give credit where credit is due and cite your sources or use footnotes or endnotes. In particular, do not post material or take solutions from Chegg or Course Hero or copy code from classmates.
  4. Learning through collaboration (defined as working with or learning from another) is an effective tool used in this class and in your future employment. Collaboration on assignments is encouraged, writing individual code, solutions and lab reports is required.
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    5. To the best of my ability, I will make this a valid and worthwhile learning experience.
    6. I will do my best to address the needs of a diverse range of learning styles in this course.

## Student support services

### Learning Center

The HSU Learning Center has a wide range of academic support services, such as **tutoring**, **supplemental instruction**, study skills, and more. [HSU Learning Center](#)

### Writing Studio

The Writing Center offers free peer assistance with writing assignments and standardized writing examination preparation. The Writing Studio's web site can be accessed at [HSU Writing Studio](#)

### Tutoring Services

The Learning Center provides tutorial assistance to students having difficulties in specific Courses. The Tutoring Services web site can be accessed at [HSU Tutorial Services](#)

### Advising

The Academic and Career Advising Center supports students' pursuit of educational goals. [HSU Academic & Career Advising Center](#)

### Mentoring

Peer academic support through Retention Through Academic Mentoring Program (RAMP) [HSU RAMP Program](#)

**Registration**

The Office of the Registrar can guide you through all your registration information. [HSU Office of the Registrar](#)

**Counseling**

The Counseling & Psychological Services Center supports the wellbeing of HSU students. [HSU Counseling & Psychological Services](#)

**Information on the syllabus is subject to change with notice.** Any significant changes will be marked in the syllabus and communicated to students via email and/or an announcement on Canvas.