

# Syllabus

## Course info

## Class meetings

|                |             |                           |                     |
|----------------|-------------|---------------------------|---------------------|
| <b>Lecture</b> | Section 001 | Mon & Wed 10:05 - 11:20am | Reuben-Cooke 130    |
|                | Section 002 | Mon & Wed 1:25 - 2:40pm   | Old Chem 116        |
| <b>Lab</b>     | Lab 01      | Tue 10:05 - 11:20am       | Reuben-Cooke 129    |
|                | Lab 02      | Tue 11:45am - 1pm         | LSRC A155           |
|                | Lab 03      | Thu 10:05 - 11:20am       | Reuben-Cooke 129    |
|                | Lab 04      | Thu 11:45am - 1pm         | Social Sciences 124 |

## Teaching team

| Name                | Role       |                             |
|---------------------|------------|-----------------------------|
| Prof. Maria Tackett | Instructor | Office Hours: Fri 1 - 3pm   |
| Sam Rosen           | Head TA    | Lab 01: Tue 10:05 - 11:20am |
| Bethany Astor       | TA         | Lab 02: Tue 11:45am - 1pm   |
| Jon Campbell        | TA         |                             |
| Donald Cayton       | TA         | Lab 02: Tue 11:45am - 1pm   |
| Allison Li          | TA         |                             |
| Mitchelle Mojekwu   | TA         | Lab 04: Thu 11:45am - 1pm   |
| Ben Thorpe          | TA         |                             |
| Linxuan Wang        | TA         | Lab 03: Thu 10:05 - 11:20am |
| Xiaojun Zheng       | TA         | Lab 04: Thu 11:45am - 1pm   |

[Click here](#) for schedule of office hours.

## Course Learning Objectives

By the end of the semester, you will be able to...

- analyze real-world data to answer questions about multivariable relationships.
- use R to fit and evaluate linear and logistic regression models.
- assess whether a proposed model is appropriate and describe its limitations.
- use Quarto to write reproducible reports and GitHub for version control and collaboration.
- effectively communicate statistical results through writing and oral presentations.

## Course community

### Duke Community Standard

All students must adhere to the [Duke Community Standard\(DCS\)](#): Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, and accountability. Citizens of this community commit to reflect upon these principles in all academic and non-academic endeavors, and to protect and promote a culture of integrity.

To uphold the Duke Community Standard, students agree:

- I will not lie, cheat, or steal in my academic endeavors;
- I will conduct myself honorably in all my endeavors;and
- I will act if the Standard is compromised.

### Inclusive community

It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity and in alignment with [Duke's Commitment to Diversity and Inclusion](#). Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally, or for other students or student groups.

Furthermore, I would like to create a learning environment for my students that supports a diversity of thoughts, perspectives and experiences, and honors your identities. To help accomplish this:

- If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. If you prefer to speak with someone outside of the course, your academic dean is an excellent resource.
- I (like many people) am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please let me or a member of the teaching team know.

## **Pronouns**

Pronouns are meaningful tools to communicate identities and experiences, and using pronouns supports a campus environment where all community members can thrive. Please update your gender pronouns in Duke Hub. You can learn more at the [Center for Sexual and Gender Diversity's website](#).

## **Accessibility**

If there is any portion of the course that is not accessible to you due to challenges with technology or the course format, please let me know so we can make appropriate accommodations.

The [Student Disability Access Office \(SDAO\)](#) is available to ensure that students are able to engage with their courses and related assignments. Students should be in touch with the Student Disability Access Office to [request or update accommodations](#) under these circumstances.

## **Communication**

All lecture notes, assignment instructions, an up-to-date schedule, and other course materials may be found on the course website, [sta210-fa23.netlify.app](#).

Links to Zoom meetings may be found in Sakai. Periodic announcements will be sent via email and will also be available through Ed Discussion and Sakai Announcements. Please check your email regularly to ensure you have the latest announcements for the course.

## **Getting help in the course**

- If you have a question during lecture or lab, feel free to ask it! There are likely other students with the same question, so by asking you will create a learning opportunity for everyone.

- The teaching team is here to help you be successful in the course. You are encouraged to attend *office hours*<sup>1</sup> to ask questions about the course content and assignments. Many questions are most effectively answered as you discuss them with others, so office hours are a valuable resource. You are encouraged to use them!
- Outside of class and office hours, any general questions about course content or assignments should be posted on the class discussion forum [Ed Discussion](#). There is a chance another student has already asked a similar question, so please check the other posts in Ed Discussion before adding a new question. If you know the answer to a question posted in the discussion forum, you are encouraged to respond!

## Email

If you have questions about assignment extensions or accommodations, please email [sta210@duke.edu](mailto:sta210@duke.edu). This email address is accessible to me and the head TA. Please see [Assignment extensions](#) for more information. If you have any other questions that are not appropriate for the public forum, you are welcome to email me directly at [maria.tackett@duke.edu](mailto:maria.tackett@duke.edu). **If you email me, please include “STA 210” in the subject line.** Barring extenuating circumstances, I will respond to STA 210 emails within 48 hours Monday - Friday. Response time may be slower for emails sent Friday evening - Sunday.

Check out the [Support](#) page for more resources.

## Textbook

While there is no official textbook for the course, readings will primarily be assigned from the following texts (all freely available online).

- [R for Data Science](#) by Garret Grolemund and Hadley Wickham
- [Introduction to Modern Statistics](#) by Mine Çetinkaya-Rundel and Johanna Hardin
- [Tidy modeling with R](#) by Max Kuhn and Julia Silge
- [Beyond Multiple Linear Regression](#) by Paul Roback and Julie Legler

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<sup>1</sup>Office hours are times the teaching team set aside each week to meet with students. [Click here](#) to learn more about how to effectively use office hours.

## **Lectures and labs**

Lectures and labs are designed to be interactive, so you gain experience applying new concepts and learning from each other. My role as instructor is to introduce you to new methods, tools, and techniques, but it is up to you to take them and make use of them. A lot of what you do in this course will involve writing code, and coding is a skill that is best learned by doing. Therefore, as much as possible, you will be working on a variety of tasks and activities throughout each lecture and lab. You are expected to prepare for class by completing assigned readings, attend all lecture and lab sessions, and meaningfully contribute to in-class exercises and discussion. Additionally, some lectures will feature application exercises that will be graded based on completing what we do in class.

You are expected to bring a laptop, tablet, or Chromebook to each class so that you can participate in the in-class exercises. Please make sure your device is fully charged before you come to class, as the number of outlets in the classroom will not be sufficient to accommodate everyone.

## **Teams**

You will be assigned to a team at the beginning of the semester. You are encouraged to sit with your teammates in lecture and you will also work with them in the lab sessions. All team members are expected to contribute equally to the completion of the labs and project, and you will be asked to evaluate your team members throughout the semester. Failure to adequately contribute to an assignment will result in a penalty to your mark relative to the team's overall mark.

You are expected to make use of the provided GitHub repository as the central collaborative platform. Commits to this repository will be used as a metric (one of several) of each team member's relative contribution for each project.

## **Activities & Assessment**

You will be assessed based on six components: application exercises, homework, labs, exams, project, and teamwork.

### **Application Exercises**

Parts of some lectures will be dedicated to working on Application Exercises (AEs). These exercises which give you an opportunity to practice apply the statistical concepts and code introduced in the prepare assignment. These AEs are due within three days of the corresponding lecture period. Specifically, AEs from Monday lectures are due Thursday by 11:59p ET, and AEs from Wednesday lectures are due Saturday by 11:59p ET.

Because these AEs are for practice, they will be graded based on making a good-faith effort in attempting all questions covered in class. You are welcome to, but not required, to work on AEs beyond lecture. Successful on-time effort on at least 80% of AEs will result in full credit for AEs in the final course grade. Because AEs are intended for in-class activities, there are no extensions given on AEs.

## **Labs**

In labs, you will apply the concepts discussed in lecture to various data analysis scenarios, with a focus on the computation and communication. Most lab assignments will be completed in teams, and all team members are expected to contribute equally to the completion of each assignment. You are expected to use the team's Git repository on the course's GitHub page as the central platform for collaboration. Commits to this repository will be used as a metric of each team member's relative contribution for each lab, and there will be periodic peer evaluation on the team collaboration. Lab assignments will be completed using Quarto, correspond to an appropriate GitHub repository, and submitted for grading in Gradescope.

*The lowest lab grade will be dropped at the end of the semester.*

## **Homework**

In homework, you will apply what you've learned during lecture and lab to complete data analysis tasks. You may discuss homework assignments with other students; however, homework should be completed and submitted individually. Similar to lab assignments, homework must be typed up using Quarto and GitHub and submitted as a PDF in Gradescope.

One homework assignment will be dedicated to a *statistics experience*. The statistics experience is an opportunity to engage with statistics and data science outside of the classroom through podcasts, books, seminars, data analysis competitions, and other activities. As you complete these experiences, the goal is to consider how the material you're learning in the course connects with society more broadly.

*The lowest homework grade will be dropped at the end of the semester.*

## **Exams**

There will be two exams in this course. Each exam will include a closed-notes in-class component and an open-note take-home component. Through these exams you have the opportunity to demonstrate what you've learned in the course thus far. The exams will focus on both conceptual understanding of the content and application through analysis and computational tasks. The content of the exam will be related to the content in reading assignments, lectures,

application exercises, homework, and lab assignments. More detail about the exams will be given during the semester.

## Project

The purpose of the **final project** is to apply what you've learned throughout the semester to analyze an interesting data-driven research question. The project will be completed with your lab teams, and each team will present their work through a written report and presentation. More information about the project will be provided during the semester.

## Grading

The final course grade will be calculated as follows:

| Category              | Percentage |
|-----------------------|------------|
| Homework              | 35%        |
| Final project         | 15%        |
| Lab                   | 15%        |
| Exam 01               | 15%        |
| Exam 02               | 15%        |
| Application exercises | 2.5%       |
| Teamwork              | 2.5%       |

The final letter grade will be determined based on the following thresholds:

| Letter Grade | Final Course Grade |
|--------------|--------------------|
| A            | $\geq 93$          |
| A-           | 90 - 92.99         |
| B+           | 87 - 89.99         |
| B            | 83 - 86.99         |
| B-           | 80 - 82.99         |
| C+           | 77 - 79.99         |
| C            | 73 - 76.99         |
| C-           | 70 - 72.99         |
| D+           | 67 - 69.99         |
| D            | 63 - 66.99         |
| D-           | 60 - 62.99         |
| F            | $< 60$             |

## Five tips for success

Your success on this course depends very much on you and the effort you put into it. The course has been organized so that the burden of learning is on you. Your TAs and I will help you by providing you with materials and answering questions and setting a pace, but for this to work you must do the following:

1. Complete all the preparation work before class.
2. Ask questions. As often as you can. In class, out of class. Ask me, ask the TAs, ask your friends, ask the person sitting next to you. This will help you more than anything else. If you get a question wrong on an assessment, ask us why. If you're not sure about the homework, ask. If you hear something on the news that sounds related to what we discussed, ask. If the reading is confusing, ask.
3. Do the readings.
4. Do the homework and lab. The earlier you start, the better. It's not enough to just mechanically plow through the exercises. You should ask yourself how these exercises relate to earlier material, and imagine how they might be changed (to make questions for an exam, for example.)
5. Don't procrastinate. The content builds upon what was taught in previous weeks, so if something is confusing to you in Week 2, Week 3 will become more confusing, Week 4 even worse, etc. Don't let the week end with unanswered questions. But if you find yourself falling behind and not knowing where to begin asking, come to office hours and work with a member of the teaching team to help you identify a good (re)starting point.

## Course policies

### Academic honesty

#### TL;DR: Don't cheat!

- Only work that is clearly assigned as team work should be completed collaboratively.
- The homework assignments must be completed individually and you are welcomed to discuss the assignment with classmates at a high level (e.g., discuss what's the best way for approaching a problem, what functions are useful for accomplishing a particular task, etc.). However you may not directly share answers to homework questions (including any code) with anyone other than myself and the teaching assistants.
- You may not discuss or otherwise work with others on the exams. Unauthorized collaboration or using unauthorized materials will be considered a violation for all students involved. More details will be given closer to the exam date.



- For the projects and team labs, collaboration within teams is not only allowed, but expected. Communication between teams at a high level is also allowed however you may not share code or components of the project or team labs across teams.
- **Reusing code:** Unless explicitly stated otherwise, you may make use of online resources (e.g. StackOverflow) for coding examples on assignments. If you directly use code from an outside source (or use it as inspiration), you must explicitly cite where you obtained the code. Any recycled code that is discovered and is not explicitly cited will be treated as plagiarism.
- **Use of artificial intelligence (AI):** You should treat AI tools, such as ChatGPT, the same as other online resources. There are two guiding principles that govern how you can use AI in this course:<sup>2</sup> (1) *Cognitive dimension:* Working with AI should not reduce your ability to think clearly. We will practice using AI to facilitate—rather than hinder—learning. (2) *Ethical dimension:* Students using AI should be transparent about their use and make sure it aligns with academic integrity.
  - **AI tools for code:** You may make use of the technology for coding examples on assignments; if you do so, you must explicitly cite where you obtained the code. Any recycled code that is discovered and is not explicitly cited will be treated as plagiarism. You may use [these guidelines](#) for citing AI-generated content.
  - **No AI tools for narrative:** Unless instructed otherwise, AI is **not** permitted for writing narrative on assignments. In general, you may use AI as a resource as you complete assignments but not to answer the exercises for you. You are ultimately responsible for the work you turn in; it should reflect your understanding of the course content.

If you are unsure if the use of a particular resource complies with the academic honesty policy, please ask a member of the teaching team.

Regardless of course delivery format, it is the responsibility of all students to understand and follow all Duke policies, including academic integrity (e.g., completing one's own work, following proper citation of sources, adhering to guidance around group work projects, and more). Ignoring these requirements is a violation of the Duke Community Standard. Any questions and/or concerns regarding academic integrity can be directed to the Office of Student Conduct and Community Standards at [conduct@duke.edu](mailto:conduct@duke.edu).

## Late work policy

The due dates for assignments are there to help you keep up with the course material and to ensure the teaching team can provide feedback within a timely manner. We understand

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<sup>2</sup>These guiding principles are based on [Course Policies related to ChatGPT and other AI Tools](#) developed by Joel Gladd, Ph.D.

that things come up periodically that could make it difficult to submit an assignment by the deadline. *Note that the lowest homework and lab assignment will be dropped to accommodate such circumstances.*

- Homework and labs may be submitted up to 2 days late. There will be a 5% deduction for each 24-hour period the assignment is late.
- There is no late work is accepted for application exercises, since these are designed as in-class activities to help you prepare for labs and homework.
- The late work policy for exams will be provided with the exam instructions.
- The late work policy for the project will be provided with the project instructions.

### **Waiver for extenuating circumstances**

If there are circumstances that prevent you from completing a lab or homework assignment by the stated due date, you may email [sta210@duke.edu](mailto:sta210@duke.edu) before the deadline to waive the late penalty. In your email, you only need to request the waiver; you do not need to provide explanation. *This waiver may only be used once in the semester, so only use it for a truly extenuating circumstance.*

If there are circumstances that are having a longer-term impact on your academic performance, please let your academic dean know, as they can be a resource. Please let me know if you need help contacting your academic dean.

### **Assignment extensions**

Sam Rosen ([sta210@duke.edu](mailto:sta210@duke.edu)) will serve as the Head TA this semester. Among many things, Sam's role is to handle all **assignment extension questions**. This includes answering questions about the late work policy, along with granting extensions based on the documented arrangements for accommodations and extenuating circumstances via the one-time late waiver or documentation from the Academic Dean. Please see [Late work policy](#) and [Waiver for extenuating circumstances](#) for more information about these policies.

Please direct all questions about late work policies to [sta210@duke.edu](mailto:sta210@duke.edu). This email will be directed to Sam and myself. **This email address only accept emails from Duke email addresses.**

## **Regrade Requests**

Regrade requests must be submitted on Gradescope within a week of when an assignment is returned. Regrade requests will be considered if there was an error in the grade calculation or if you feel a correct answer was mistakenly marked as incorrect. Requests to dispute the number of points deducted for an incorrect response will not be considered. Note that by submitting a regrade request, the entire question will be graded which could potentially result in losing points.

*No grades will be changed after the final project presentations.*

## **Attendance policy**

Every student is expected to attend and participate in lecture and labs. There may be times, however, when you cannot attend class. Lecture recordings are available upon request for students who have an excused absence. See the [Lecture recording request](#) policy for more detail. If you miss a lecture, make sure to review the material and complete the application exercise, if applicable, before the next lecture. Labs dedicated to completing the lab assignment and collaborating with your lab team. If you miss a lab session, make sure to communicate with your lab TA and teammates about how you can make up your contribution. If you know you're going to miss a lab session and you're feeling well enough to do so, notify your lab TA and teammates ahead of time.

More details on Trinity attendance policies are available [here](#).

## **Attendance Policy Related to COVID Symptoms, Exposure, or Infection**

Student health, safety, and well-being are the university's top priorities. To help ensure your well-being and the well-being of those around you, please do not come to class if you have tested positive for COVID-19 or have possible symptoms and have not yet been tested. If any of these situations apply to you, you must follow university guidance related to the ongoing COVID-19 pandemic and current health and safety protocols. If you are experiencing any COVID-19 symptoms, contact student health ([dshcheckin@duke.edu](mailto:dshcheckin@duke.edu), 919-681-9355). Learn more about current university policy related to COVID-19 at [coronavirus.duke.edu](https://coronavirus.duke.edu).

To keep the university community as safe and healthy as possible, you will be expected to follow these guidelines. Please reach out to me and your academic dean as soon as possible if you need to quarantine or isolate so that we can discuss arrangements for your continued participation in class.

## **Lecture recording request**

Lectures will be recorded on Panopto and will be made available to students with an excused absence upon request. Videos shared with such students will be available for a week after the lecture date. To request a particular lecture's video, please fill out the form at [forms.office.com/r/FbRXJm4Ln1](https://forms.office.com/r/FbRXJm4Ln1). Please submit the form within 24 hours of missing lecture to ensure you have sufficient time to watch the recording. Please also make sure that any official documentation, such as STINFs, Dean's excuses, NOVAPs, and quarantine/removal from class notices from student health are also uploaded to the form.

About one week before each exam, the class recordings will be available to all students. These recordings will be available until 10am the day of the exam.

## **Accommodations**

### **Academic accommodations**

If you are a student with a disability and need accommodations for this class, it is your responsibility to register with the Student Disability Access Office (SDAO) and provide them with documentation of your disability. SDAO will work with you to determine what accommodations are appropriate for your situation. Please note that accommodations are not retroactive and disability accommodations cannot be provided until a Faculty Accommodation Letter has been given to me. Please contact SDAO for more information: [sdao@duke.edu](mailto:sdao@duke.edu) or [access.duke.edu](https://access.duke.edu).

### **Religious accommodations**

Students are permitted by university policy to be absent from class to observe a religious holiday. Accordingly, Trinity College of Arts & Sciences and the Pratt School of Engineering have established procedures to be followed by students for notifying their instructors of an absence necessitated by the observance of a religious holiday. Please submit requests for religious accommodations at the beginning of the semester so that we can work to make suitable arrangements well ahead of time. You can find the policy and relevant notification form here: [trinity.duke.edu/undergraduate/academic-policies/religious-holidays](https://trinity.duke.edu/undergraduate/academic-policies/religious-holidays)

## **Academic and wellness support**

### **Academic Resource Center**

There are times may need help with the class that is beyond what can be provided by the teaching team. In those instances, I encourage you to visit the Academic Resource Center. The

[Academic Resource Center \(ARC\)](#) offers free services to all students during their undergraduate careers at Duke. Services include Learning Consultations, Peer Tutoring and Study Groups, ADHD/LD Coaching, Outreach Workshops, and more. Because learning is a process unique to every individual, they work with each student to discover and develop their own academic strategy for success at Duke. Contact the ARC to schedule an appointment. Undergraduates in any year, studying any discipline can benefit! Contact [ARC@duke.edu](mailto:ARC@duke.edu), 919-684-5917.

## **CAPS**

[Duke Counseling & Psychological Services \(CAPS\)](#) helps Duke Students enhance strengths and develop abilities to successfully live, grow and learn in their personal and academic lives. CAPS recognizes that we are living in unprecedented times and that the changes, challenges and stressors brought on by the COVID-19 pandemic have impacted everyone, often in ways that are tax our well-being. CAPS offers many services to Duke undergraduate students, including brief individual and group counseling, couples counseling and more. CAPS staff also provides outreach to student groups, particularly programs supportive of at-risk populations, on a wide range of issues impacting them in various aspects of campus life. CAPS provides services to students via Telehealth. To initiate services, you can contact their front desk at 919-660-1000.

## **Important dates**

- **Aug 28:** Classes begin
- **Sep 8:** Drop/add ends
- **Oct 16 - 17:** Fall break
- **Nov 10:** Last day to withdraw with W
- **Nov 22 - 26:** Thanksgiving recess
- **Dec 8:** Classes end
- **Dec 9 - 12:** Reading period
- **Dec 13 - 18:** Final exams

[Click here](#) for the full Duke academic calendar.