Welcome to MTH 161

Fall 2024 new line

Chris Hallstrom

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Course Details

Teaching team

Instructor

Prof. Chris Hallstrom
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Teaching assistants

Shuo Wang	Head + Lab TA
Sylvia Vincent	Lab TA
John Gillen	Lab TA
Chris Oswald	Lab TA
Minh Anh To	TA
Hao Wang	TA
Noah Obuya	TA
Meghna Katyal	TA
Avery Hodges	TA

Timetable

- Lectures at Gross Hall 103: Mon + Wed 1:25 - 2:40 pm
- Labs at Perkins LINK 087 (Classroom 3)
  - Lab 1: Fri 8:30 - 9:45 am
  - Lab 2: Fri 10:05 - 11:20 am
  - Lab 3: Fri 11:45 am - 1:00 pm
  - Lab 4: Fri 1:25 - 2:40 pm

Learning objectives

1. Recognize the importance of data collection, identify limitations in data collection methods, and determine how they affect the scope of inference.
2. Use statistical software to summarize data numerically and visually, and to perform data analysis.
3. Have a conceptual understanding of the unified nature of statistical inference.
4. Apply estimation and testing methods to analyze single variables or the relationship between two variables in order to understand natural phenomena and make data-based decisions.
5. Model numerical response variables using a single or multiple explanatory variables.
6. Interpret results correctly, effectively, and in context without relying on statistical jargon.

But first...

Let's play a game!

- Form a small group (2-4 people) with people sitting around you
- First, introduce yourselves to each other – name (and proper pronunciation of name), year, major, where are you from, etc.
- Play the game: https://nyti.ms/3suUJHG

Course components

Course website

sta101-f23.github.io

aka “the one link to rule them all”

Lectures

- In person
- Attendance is required (as long as you're healthy!)
- A little bit of everything:
  - Traditional lecture
  - Live coding + demos
  - Short exercises + solution discussion
- Recordings will be posted after class – to be used for review + make-up if you can't make it to class due to health reasons, they're not an alternative to class attendance

Labs

- Attendance is required (as long as you're healthy!)
- Opportunity to work on course assignments with TA support
- Opportunity to work with teammates on projects

Announcements

- Posted on Canvas (Announcements) and sent via email, be sure to check both regularly
- I'll assume that you've read an announcement by the next "business" day

Diversity and inclusion

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.

- If you have a name that differs from those that appear in your official Duke records, please let me know! Add your name pronunciation to your Canvas and Slack profiles.
- Please let me know your preferred pronouns and add these to your Canvas and Slack profiles.
- 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. I want to be a resource for you. If you prefer to speak with someone outside of the course, your advisers and deans are excellent resources.
- I (like many people) am still in the process of learning about

Accessibility

- The Student Disability Access Office (SDAO) is available to ensure that students are able to engage with their courses and related assignments.
- We will have **in class exams**. If you need special accommodations, please book the **testing center** ASAP!
- I am committed to making all course materials accessible and I'm always learning how to do this better. If any course component is not accessible to you in any way, please don't hesitate to let me know.

Assessments

Attendance + participation (5%)

- Required throughout the semester in lecture and lab
- Students who attend at least 80% of the lectures and participate regularly in lecture and/or other course venues (lab + Slack) will receive full credit for this portion of their grade
- Participation in labs as well as on Slack will also count towards this component

Tip

If you attend at least 80% of the classes, you'll get all available points for this component.

Interactive tutorials (5%)

- Online, individual, can discuss with classmates
- Cover reading that is due since the previous quiz and up to and including the deadline for the given quiz
- Make sure to fill out your name and **Net ID** prior to generating the hash to submit (more info on this coming soon)
- Due by 5 pm ET (on the indicated day on the course schedule

Tip

If you complete at least 80% of the tutorials, you'll get all available points for this component.

Labs (25%)

- Submitted on Gradescope, individual, can discuss with classmates
- Lab sessions allocated to working on assignments and getting feedback from TAs
- Due by 5 pm ET on the indicated day on the course schedule
- Weekly deadlines to keep you on track, hard deadlines by exams or end of class

Tip

Lowest lab score is dropped, whether it's an actual low score or a 0 from not turning it in.

Exams

- Two exams, each 20%
- Each exam comprised of two parts:
  - In class: 75 minute in-class exam. Closed book, one sheet of notes ("cheat sheet", no larger than 8 1/2 x 11, both sides, **must be prepared by you**) – 70% of the grade
  - Take home: 48 hours to complete the take home portion. The take home portion will follow from the in class exam and focus on the analysis of a dataset introduced in the take home exam – 30% of the grade

Caution

Exam dates cannot be changed and no make-up exams will be given. If you can't take the exams on these dates, you should drop this class.

Projects

- Project 1 (10%)
  - Same data, regression
  - Write-up only
- Project 2 (15%)
  - Dataset of your choice, method of your choice
  - New team
  - Presentation and write-up
  - Presentations on the final exam date
- Interim deadlines, peer review on content, peer evaluation for team contribution
- Some lab sessions allocated to working on projects, doing peer review, getting feedback from TAs

Caution

Final presentation date cannot be changed. If you can't present on that date, you should drop this class.

Teams

- Teamwork
  - Projects (required), in class exercises (recommended)
  - Assigned different teams for each project
  - Peer evaluation during teamwork and after completion
- Expectations and roles
  - Everyone is expected to contribute equal *effort*
  - Everyone is expected to understand *all* code turned in
  - Individual contribution evaluated by peer evaluation, commits, etc.

Course policies

COVID policies

- Wear a mask if the university requires
- Stay home if you're sick and follow guidance
- Read and follow university guidance

Late work policy

- Interactive tutorials: Late submissions past the hard deadlines not accepted
- Labs:
  - Late, but within 24 hours of deadline: -20% of available points
  - Any later: No credit, and we will not provide written feedback
  - Note that lowest lab score will be dropped, even if that score is a 0
- Project write-ups:
  - Late, but within 24 hours of deadline: -20% of available points
  - Any later: No credit, and we will not provide written feedback
  - Two days late or later: No credit, and we will not provide written feedback
- Project presentation: Late submissions not accepted
- Peer evaluation:
  - Late submissions not accepted

Collaboration policy

- Only work that is clearly assigned as team work should be completed collaboratively (projects)
- Exams must be completed individually, you may not discuss answers with teammates, clarification questions should only be asked to myself and the TAs
- Labs must be completed individually. You may not directly share answers / code with others, however you are welcome to discuss the problems in general and ask for advice

Sharing / reusing code policy

- We are aware that a huge volume of code is available on the web, and many tasks may have solutions posted
- Unless explicitly stated otherwise, this course's policy is that you may make use of any online resources (e.g., StackOverflow) but you must explicitly cite where you obtained any code you directly use or use as inspiration in your solution(s)
- Any recycled code that is discovered and is not explicitly cited will be treated as plagiarism, regardless of source

Generative AI policy

You should treat generative AI, such as ChatGPT, the same as other online resources. There are two guiding principles that govern how you can use AI in this course:[1]

(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.
- **AI tools for narrative:** Unless instructed otherwise, you may not use generative AI to write narrative on assignments. In general, you may use generative AI as a resource as you

Academic integrity

To uphold the Duke Community Standard:

- I will not lie, cheat, or steal in my academic endeavors;

most importantly:

ask if you're not sure if something violates a policy!

Academic integrity

To uphold the Duke Community Standard:

- I will not lie, cheat, or steal in my academic endeavors;
- I will conduct myself honorably in all my endeavors; and

most importantly:

ask if you're not sure if something violates a policy!

Academic integrity

To uphold the Duke Community Standard:

- 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.

most importantly:

ask if you're not sure if something violates a policy!

Support

Office hours

- Mine: Tuesdays 3:30 - 4:30 pm - Old Chem 213 + by appointment (on Zoom or in person depending on day/time)
- TAs: See the course team and course support pages on the course website. We have a total of 17 TA office hours per week!
- + lots more resources listed on the syllabus!

Wellness

I want to make sure that you learn everything you were hoping to learn from this class. If this requires flexibility, please don't hesitate to ask.

- You never owe me personal information about your health (mental or physical) but you're always welcome to talk to me. If I can't help, I likely know someone who can.
- I want you to learn lots of things from this class, but I primarily want you to stay healthy, balanced, and grounded.

Course Tools

RStudio

https://posit.cloud

- Browser based RStudio instance(s) provided by Posit
- Requires internet connection to access
- Provides consistency in hardware and software environments
- Local R installations are fine but we will not guarantee support

Slack

- Online forum for asking and answering questions
- Private repo in the course organization
- You will need to join the course organization for access
- Ask **and answer** questions related to course logistics, assignment, etc. here
- Personal questions (e.g., extensions, illnesses, etc.) should be via email to me
- Once you join, browse the channels to make sure you're posting questions in the right channel, update your profile with your name, photo/avatar of you that matches your GitHub profile, and your pronouns
- **Unfortunately** Slack is **not** the best place to in-depth questions, but it's a great place for real-time connection and collaboration

To do before...

To do before...

we move on

See course announcement (on Canvas or in your email) and click on the links to

- Log in to Posit Cloud – and update your profile
- Log in to Slack – and update your profile with your photo, pronouns, name pronunciation

the next class on Wednesday

- Read the syllabus
- Complete the *Getting to know you* survey on Canvas
- Complete the readings

the end of the week

- Get started on the lab assignment
- Complete the interactive tutorials

Hello data

Application exercise: UN Votes

Go to Posit Cloud and start the project called UN Votes. Render the document titled `unvotes.qmd`. Review the narrative and the data visualization you just created. Then, change "Turkey" to another country of your choice. Re-render the document. Show the plot you created to your neighbor and discuss (1) why you chose that country and (2) how this new visualization is different than the original (and what that says about country politics, if anything).

Time permitting: How were these data collected?