# intro_stats

Introduction to Statistics: School of Criminal Justice - RU-N

View the Project on GitHub f-edwards/intro_stats

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| Introduction to Statistics | 27:202:542 |
| Lecture: Tuesday, Thursday 10:00 - 11:20 | Room: CLJ 574 |
| Instructor: Frank Edwards | frank.edwards@rutgers.edu |
| Office hours: Friday, 10:00-12:00 | Room: CLJ 579B |

## Quick links

Lecture slides

Homework assignments

## Course description

This is the course syllabus for Introduction to Statistics, Fall 2024. It is a graduate-level introduction to conducting quantitative social science research, and is the first part of a two-semester sequence.

For computing and data analysis workflow, we will cover the foundations of statistical computing with a heavy emphasis on data visualization using the R programming language and tidyverse suite of packages. You will also learn how to write professional reports on statistical findings using the RMarkdown format for fusing code and plain text writing together.

For statistics, we will review core mathematical concepts in algebra, linear algebra, and calculus, then proceed to build foundations in core probability theory. From there, we will learn foundational principles and techniques in statistical inference and conclude the class with a detailed unit on linear regression.

## Course goals

1. Become comfortable fundamentals of probability and statistics. By the end of the course, they should be able to interpret and use common statistical measures of central tendency and variability, and be able to describe and interpret random events using probability statements.

2. Learn how to describe and estimate relationships for continuous outcomes using linear regression.

3. Use command-line interfaces for interacting with a computer and its file structure.

4. Design and write basic data analysis programs using the R programming language.

5. Produce univariate and bivariate data visualizations using the ggplot2 library in R.

## Books

- Open Intro to Statistics. 2019. https://www.openintro.org/book/os/
- Healy, Data Visualization. 2018. https://socviz.co/
- Alexander, Rohan. Telling Stories with Data. 2023. https://tellingstorieswithdata.com/

## Communication

We will use Slack for course discussion and communication. Email is my preferred mode of one-on-one communication.

## Expectations

- Attendance is strongly recommended. We move fast, it'll be hard to keep up if you miss lecture.
- Bring a computer - we'll be writing code in class.
- Complete homework on time. Homework should take between 4-8 hours to complete. *Don't start them the day before they are due.* All students are granted one no-questions-asked extension on homework assignments. Please notify me if you are using it for the week.
- Be respectful and professional. Be mindful of the space you take up in the classroom.
- Collaborate with your colleagues. Social science is a team sport. I encourage you all to work together to complete assignments. However, you DO need to submit your own work. We will penalize work that is copy/pasted from other students or online sources.
- Document your code. Explain what your code does in lots of detail. It helps you and helps us to evaluate your work.
- Don't use AI tools, they won't help you learn how to do data analysis or write better papers. Also they are burning the planet.

## Prerequisites

No prior statistics or programming experience is assumed. I assume that you are comfortable with algebra, geometry, and basic calculus.

## Software

All instruction will be conducted in the R statistical programming language. R is free and open-source, and can be downloaded here.