

# **Methods Camp**

**UT Austin, Department of Government**

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# Class schedule

Date	Time	Location
Fri, Aug. 11	9:00 AM - 4:00 PM	RLP 1.302B
Sat, Aug. 12	No class	-
Sun, Aug. 13	No class	-
Mon, Aug. 14	9:00 AM - 4:00 PM	RLP 1.302B
Tues, Aug. 15	9:00 AM - 4:00 PM	RLP 1.302B
Weds, Aug. 16	9:00 AM - 4:00 PM	RLP 1.302B
Thurs, Aug. 17	9:00 AM - 4:00 PM	RLP 1.302B

On class days, we will have a lunch break from 12:00-1:00 PM. We'll also take short breaks periodically during the morning and afternoon sessions as needed.

## Description

Welcome to Introduction to Methods for Political Science, aka “Methods Camp”! In the past our incoming students have told us their math skills are rusty and they would like to be better prepared for UT’s methods courses. Methods Camp is designed to give everyone a chance to brush up on some skills in preparation for the Stats I and Formal Theory I courses. The other goal of Methods Camp is to allow you to get to know your cohort. We hope that struggling with matrix algebra and the dreaded chain rule will still prove to be a good bonding exercise.

As you can see from the above schedule, we’ll be meeting on Friday, August 11th as well as from Monday, August 14th through Thursday, August 17th. Classes at UT begin the start of the following week on Monday, August 22nd. Below is a tentative schedule outlining what will be covered in the class, although we may rearrange things a bit if we find we’re going too slowly or too quickly through any of the material.

## Course outline

### 01 Friday morning: R and RStudio

- Introductions

- RStudio (materials are on the website as zipped RStudio projects)
- Objects (vectors, matrices, data frames)
- Basic functions (mean(), length(), etc.)

## **02 Friday afternoon: Tidyverse basics I**

- Packages: installation and loading (including the tidyverse)
- Data wrangling with dplyr (basic verbs, including the new .by = syntax)
- Data visualization basics with ggplot2
- Data loading (.csv, .rds, .dta/.sav, .xlsx)
- Quarto fundamentals

## **03 Monday morning: Matrices**

- Matrices
- Systems of linear equations
- Matrix operations (multiplication, transpose, inverse, determinant).
- Solving systems of linear equations in matrix form (and why that's cool)
- Introduction to OLS

## **04 Monday afternoon: Tidyverse basics II**

- Data merging and pivoting (join(), pivot())
- Value recoding (if\_else(), case\_when())
- Missing values
- Data visualization extensions: facets, text annotations

## **05 Tuesday morning: Functions and loops**

- Functions
- For-loops and lapply()
- Finding R help (help files, effective Googling, ChatGPT)

## **06 Tuesday afternoon: Calculus**

- Limits (not sure how to teach this in an R-centric way yet, but there must be a way)
- Derivatives (symbolic, numerical, automatic)
- Integrals

## **07 Wednesday morning: Probability**

- Concepts: probability, random variables, etc.
- PMF, PDF, CDF, etc.
- Distributions (binomial, normal; different functions in R and how to use them)
- Expectation and variance

## **08 Wednesday afternoon: Simulations**

- Simulations (ideas, seed setting, etc.)
- Sampling
- Bootstrapping

## **09 Thursday morning: Text analysis**

- String manipulation with stringr
- Simple text analysis (counts, tf-idf, etc.) with tidytext and visualization

## **10 Thursday afternoon: Wrap-up**

- Project management fundamentals (RStudio projects, keeping raw data, etc.)
- Self-study resources and materials
- Other software (Overleaf, Zotero, etc.)
- Methods at UT

## **Contact info**

If you have any questions during or outside of methods camp, you can contact Andrés at [andres.cruz@utexas.edu](mailto:andres.cruz@utexas.edu) and Matt at [mjmartin@utexas.edu](mailto:mjmartin@utexas.edu).

# 1 R and RStudio

## 2 Tidyverse basics I

## 3 Matrices



## 4 Tidyverse basics II

## **5 Functions and loops**

## 6 Calculus

## 7 Probability

## 8 Simulations

## **9 Text analysis**

## 10 Wrap up

## References