

Welcome to Math Camp (2021)

**Dept. of Political Science
University of Wisconsin–Madison**

**Instructors:
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Math and Political Science

(Political Science and Math)

Why math?

In general...

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Discover hidden insights

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Formalizing: lay out premises and assumptions, derive implications

Discover hidden insights

Even if you don't do highly mathematical work, you will encounter it

**For empirical research
(data analysis...)**

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Principled measurement methods

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Make judgments about *statistically meaningful* findings (vs. random noise)

Make causal inferences

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Define sets of actors, preferences, incentives

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Derive actors' strategies for optimal payoffs

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Dealing with limited information, probabilistic beliefs, learning from new information

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- Preparation for methods courses
- Practicing essential arithmetic routines

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- Show where political science needs math (using examples)
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You won't memorize everything we cover this week,

but you need to be able to "roll with it" in class

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- Different areas of research emphasize different areas of math (and specialization is the norm)
- You get out what you put in

Questions so far?

Agenda

Mornings (9–12ish): math lessons

Lecture slides, definitions, examples

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Afternoons: practice

Take-home exercises will be distributed

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Contact your instructors at any time

Feel free to contact us through Slack or via email and we will be responding to questions until 9PM

(But you should feel free to ask questions throughout)

Monday: Essential algebra and pre-calculus (Marcy)

- Fundamentals, notation, functions

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Tuesday: Linear algebra, Intro to R (Marcy)

- Vectors and matrices
- Useful for manipulating real data
- How to use basic commands in R

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Thursday: Finish calculus (Anton), Quiz

- Quiz to get a sense of how comfortable you are with math

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Friday: Probability (Anton), Methods Q&A

- Mathematical intuitions of independent and conditional probability
- Probabilistic processes (random variables), patterns in "real data"

Deliverables?

Daily exercises (not collected)

No final exam (or grades of any kind)

You are in charge of yourselves

Questions?

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- Ask lots of questions! They help the entire class!
- Slow us down
- Ask *why* we are learning something

Resources

The [Github repository](#):

- Slides, exercises
- Source code to build it all

Other resources:

- Gill, *[Essential Mathematics for Political and Social Research](#)*
- Moore & Siegal: *[A Mathematics Course for Political & Social Research](#)*

About your instructors

Marcy Shieh



Originally from California (SF Bay Area)

Studies American politics & political methodology (since 2017)

Judicial politics, campaign rhetoric, institutions

Methodological focus: text analysis and experiments

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Anton Shirikov



Originally from Russia. Switched back and forth between journalism and academia, but finally settled on the latter

Studies comparative politics & political methodology (since 2015)

Authoritarian politics, media, propaganda, legacies of communism

Methodological focus: experiments

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Let's get started