Math Camp

Summer 2017

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1 Course Description

The five sessions of Math Camp will cover the key concepts and theories in basic algebra, linear algebra, and calculus, underlying most work in quantitative political research. Each session consists of a 120-minute lecture including exercises. You are free, but not required, to read the textbook or do some exercises on your own before the session.

You do not need to know anything about calculus or linear algebra to attend the session. Nor do you need to be anxious. An ultimate goal of these sessions is to help you overcome the fear of learning and applying math. So, don't worry, we will start from scratch. If you believe that you already have sufficient mathematic knowledge, there is still a value to attend the lectures. You will learn how the knowledge and skills are applied in the political methodology and how they will help study the substantive political topics you are interested. Moreover, it is also a good time for you to know your cohort and make friends.

2 Textbook and Resources

Moore, Will and David Siegel. 2013. *A Mathematics Course for Political and Social Research.* Princeton University Press.

This book can be accessed online through the UI library website. You don't have to buy it. But it is a good mathematical reference for political science students. There is a YouTube channel consisting of videos on every topic covered in the book.
https://www.youtube.com/channel/UCrA2SLUKnV6yjdgIfDwFeGg/playlists

- Other Suggested Readings
  Hagel, Timothy. 1995. *Basic Math for Social Scientists: Concepts. Sage Publications.*
  Gill, Jeff. 2006. *Essential Mathematics for Political and Social Research. Cambridge University Press.*

- Video Resources
  Khan Academy
  https://www.khanacademy.org/
  MIT Video Courses
  http://ocw.mit.edu/courses/audio-video-courses/

3 Schedule

(1) August 14, Monday Building blocks

- 10:00am - noon: Notations, operators, and sets
- 1:30pm 3:30pm: Exponents, logarithm, and functions
- *Reading: Moore & Siegel, Chapter 1, 3*

(2) August 15, Tuesday Linear algebra and Calculus

- 10:00am - noon: Vectors and matrices
- 1:30pm 3:30pm: Differentiation
- *Reading: Moore & Siegel, Chapter 5, 6 & 12*

(3) August 18, Friday More Calculus

- 10:00am - noon: Integration
- *Reading: Moore & Siegel, Chapter 7*