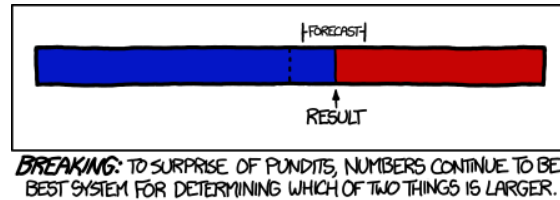


University of Michigan Political Science Math Camp - Summer 2014

Instructor: Jason S. Davis. Office: 7730 Haven Hall
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Schedule: August 18-22 and 25-27, 10AM-12PM and 4PM-5:30PM
Location: TBD
Course website: TBD



Math Camp Overview

After months of the dreariness that is warmth, free time, and sunshine, math camp has finally arrived! We will meet twice daily, once in the morning from 10AM-12PM, and once in the afternoon from 4PM-5:30PM. The goal is to provide a review of some of the essential math that you will see in much of social science research, and to prepare you for taking the first courses in the formal theory and statistics sequences (PS598 and PS599). While this course is not for credit, there will be practice problems and a few quizzes to help you solidify your understanding of the concepts we cover. Mathematics is best learned through a combination of instruction and practice, and during this short course the hope is to integrate both.

Practice Problems

Practice problems will be assigned twice daily: once after the morning lecture, which you should try to work through before the afternoon lecture, and once after the afternoon lecture. They will be designed such that they shouldn't take longer than 1-1.5 hours; if you find this is not the case you should let me know! You are encouraged to work together on these problem sets, but you are also encouraged to try them on your own before meeting as a group. They will not be graded, but solutions will be posted, which you should read carefully to ensure you can identify and understand any mistakes made. Additionally, we may work through some of the problems in class. I will also be available for one office hour a day to discuss the practice problems and anything else.

Quizzes

There will be a diagnostic quiz to start off the course, just to get a sense of where everyone is. There will also be quizzes on August 21 and August 27, which will cover content from days 1-4 and days 5-8 respectively. These will be graded so that you can get some feedback, but the grades will not be used for anything beyond providing you with (hopefully useful!) information.

Suggested Textbooks

- Simon and Blume - *Mathematics for Economists*:
Course lectures will be at approximately this level, and this is a great reference text for a lot of the math you can expect to use in your career. This will also be one of the main textbooks used in PS598.
- DeGroot and Schervish - *Probability and Statistics*:
An introduction to mathematical statistics/probability theory that is both rigorous and accessible.
- Moore and Siegel - *A Mathematics Course for Political and Social Researchers*:
This text is a great intuitive introduction to a lot of the math you'll need, with political science examples. It's pitched at a somewhat lower level than the lectures will be, although this would be a great bridge to get up to the level of the lectures. There is also a video course by David Siegel (one of the authors of the book), linked to [here](#), which follows content from the book and may be a very useful resource for some of you.

Course Schedule

- Day 1 - August 18: Diagnostic quiz. Pre-calculus/functions.
 - Simon and Blume Ch. 2.
- Day 2 - August 19: More pre-calculus. Introduction to differentiation.
 - Simon and Blume Ch. 3.
- Day 3 - August 20: More on differentiation (including some partial differentiation), basic optimization.
 - Simon and Blume Ch. 4-5.
- Day 4 - August 21: Last bit of differentiation, introduction to integration. Quiz 1.
 - Simon and Blume Ch. 4-5. Appendix 4.
- Day 5 - August 22: Introduction to set theory and probability theory.
 - Simon and Blume Appendix 1, DeGroot and Schervish Ch. 1-2.
- Day 6 - August 25: More probability theory, random variables, distributions. Expectation operator, moments (including variance and rules for variance).
 - DeGroot and Schervish Ch. 3-5.
- Day 7 - August 26: Introduction to linear algebra.
 - Simon and Blume Ch. 7-9.
- Day 8 - August 27: More linear algebra. Quiz 2.
 - Simon and Blume Ch. 10-11.