University of California, Davis
Department of Political Science

Math Camp

594 Kerr Hall

Fall 2014

Kyle A. Joyce
Office: 576 Kerr Hall
Email: kjoyce@ucdavis.edu
URL: http://psfaculty.ucdavis.edu/kjoyce/

Teaching Assistant
Daniel Tapia-Jimenez
Office: 662 Kerr Hall
Email: datapiajimenez@ucdavis.edu

The purpose of the Math Camp is to introduce (or re-introduce) you to some of the mathematical concepts that are essential for formal and quantitative analysis in political science research and to prepare you for the statistical research methods sequence here at UC Davis. Some of the topics we will cover include matrix algebra and calculus. While entire courses are devoted to such topics in mathematics or statistics departments, we will focus on the specific mathematical concepts that are most commonly used in formal and quantitative research in political science. The goal of the camp is to ensure that students have a firm understanding of these critical concepts so that the courses in the methods sequence can build upon a common foundation. Note: I assume no prior mathematical skills beyond those learned in high school algebra.

Although the course is not graded (and not for credit), a problem set will be handed out at the end of each lecture. The problem sets are intended as an opportunity for you to practice the concepts we discuss in the lectures and as a mechanism for you to assess your progress with the material. The problem sets will be a mix of analytic and computational problems. The computational problems will require using R, which is a statistical computing environment and high-level programming language. R is open source and can be downloaded for free from the Comprehensive R Archive Network (CRAN) and is also installed on the computers in the grad lab. There is a very useful Integrated Development Environment (IDE) for R that can be downloaded for free here: RStudio. There are many R-related resources available on the web. Below are links to some useful R resources:

R Programming Wikibook

An Introduction to R

R Reference Card

Readings

There is one required book for Math Camp:

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

In addition, there are four recommended books:

Hagle, Timothy M. 1995. *Basic Math for Social Scientists: Concepts*. Thousand Oaks, CA: Sage Publications, Inc.

Namboodiri, Krishnan. 1984. *Matrix Algebra: An Introduction*. Thousand Oaks, CA: Sage Publications, Inc.

Kleppner, Daniel and Norman Ramsey. 1985. *Quick Calculus: A Self-Teaching Guide*, 2nd ed. New York: John Wiley & Sons, Inc.

Simon, Carl P. and Lawrence Blume. 1994. *Mathematics for Economists*. New York, NY: W.W. Norton & Company, Inc.

The Moore and Siegel book is a comprehensive introduction to all of the topics we will cover. The Hagle book is a very short introduction to most of the topics we will cover. The Namboodiri book provides a very detailed step-by-step introduction to Matrix Algebra. The Kleppner and Ramsey book is a very nice introduction to calculus. Finally, Simon and Blume is a very comprehensive advanced book. I have found it is often useful to have several sources to consult, especially if one book happens to leave you puzzled. I will make sure that of all of the books are available for your use during Math Camp. Note: you should do the reading assigned for a given day **before** coming to class.

All lectures, problem sets, and supplementary material will be posted on SmartSite@UCDavis.

Schedule

Date	Time	Topic
September 22 (M)	9am-12pm	**The Basics** Moore & Siegel: Chapters 1-4
September 23 (T)	9am-12pm	Homework Session
	1pm-4pm	**Calculus** Moore & Siegel: Chapters 5-7
September 24 (W)	9am-11am	**Calculus**
	11am-12pm	Coffee break with faculty & graduate students
	1pm-3pm	**Calculus**
September 25 (Th)	9am-12pm	Homework Session
	1pm-4pm	**Matrix Algebra** Moore & Siegel: Chapters 12-13
September 26 (F)	11am-12pm	**Matrix Algebra**
	12pm-1pm	Lunch Panel: "Surviving the First Year"
	1pm-2pm	**Matrix Algebra**
	2pm-4pm	Professional Development in Political Science
September 29 (M)	9am-12pm	Homework Session
	12pm-4pm	Department Orientation
	4pm-5:30pm	Welcome reception with faculty & graduate students
September 30 (T)	10:20am-4:10pm	*No Math Camp* Teaching Resource Center (TRC) Training
October 1 (W)	9am-12pm	**Probability** Wackerly, Mendenhall, and Scheaffer: Ch. 1 Verzani: Ch. 1 & 2