Review of Mathematics for Social Scientists
CS&SS 505 / SOC 512
Winter 2021

Instructor Information
Name: Aaron Osgood-Zimmerman, MS (PhD candidate, Statistics)
Email: azimmer@uw.edu
Office hours: Tuesdays & Fridays 2:00 – 3:00
Office: https://washington.zoom.us/j/92787632217 (on canvas)

Course Information
Website: https://canvas.uw.edu (let me know if you don't have access)
Time: Thursdays 12:30 – 1:20
Location: https://washington.zoom.us/j/94857989326 (on canvas)
Final Exam: We will have a take-home final distributed on Thursday March 11 and due Thursday, March 18, 2021 at 12:30pm.

Course Description
This course provides a quick and short one-credit review of some of the mathematics and probability needed to take the graduate courses offered by the Center for Statistics and the Social Sciences. It reviews calculus, matrix algebra, probability, and concludes with a primer on statistics.

Curriculum Overview
1 Algebra, geometry, functions review
2 Matrix algebra
3 Differential calculus
4 Integral calculus
5 Introduction to probability
6 Random variables
7 Probability density functions
8 Discrete distributions
9 Continuous distributions
10 Introduction to statistics

Requirements
Your course grade will be based on homework assignments (60%), participation (10%), and a final exam (30%). The class is graded Credit/ No Credit overall, but numerical grades will be assigned for homework, participation, and final exam as feedback. Homework will be assigned most weeks in class, and will be due in class on the Wednesday of the following week at 12:30pm. Late homework cannot be accepted. You will be asked to present completed homework problems to the rest of the class at least once.

Goals and Remote Teaching

My primary goal for this course is to provide you with the a refresher on – and build your confidence in using - the mathematical tools you may need to survive and thrive in your graudate programs. This is not meant as a deep dive into any of these subjects, but as a review of material which you have hopefully seen before.

With this and the remote nature of the course in mind, I'll be recording my lectures ahead of time to allow you to learn at your own pace on your own time. To get the most out of the class, you should watch the lecture for the week before we meet on Thursdays. Scheduled in-class time will still occur and it will be a mix of Q&A, practice working problems by yourself or in small groups, and students presenting solutions to the class. *Class meetings will also be recorded and will be available to other students for later review.*

On Day 1, I'll take a poll to help me understand how best to structure the in-class portion of the course to allow you to get the most from it.

Participation

Each week, with submitted homework, you will be required to indicate at least 3 homework problems you feel confident you could present to the class. You may also request problems that you found difficult to be presented. I will put together a list of problems and presenters and send it around Wednesday afternoon to allow you time to prepare. My hope is that this will encourage participation in class, allow students to learn from different problem solving styles, and give you a small amount of presentation practice.

Feedback

Please feel free to email, or discuss with me during office hours, feedback you have on my lectures or use of in-class time. If you prefer, you can also submit anonymous feedback on the Anonymous Feedback Page on the course canvas site. I will also be requesting more specific feedback after week 3 and 6 to help me tailor the remainder of the class.

Texts

Much of the material is covered in introductory calculus, linear algebra and statistics texts, and in high school integrated math texts. Here are two suggested books that cover much of the material at about the level of the course and are designed for social scientists. They are also available at a reasonable price.

Iversen, Gudmund R. (1996). *Calculus.* Series: Quantitative Applications in the Social Sciences. Sage.

Namboodiri, Krishnan (1984). *Matrix algebra* Series: Quantitative Applications in the Social Sciences. Sage.

If you have questions about text references for other subjects, feel free to shoot me an e-mail.