Political Science 7014
Intermediate Political Methodology
Baldwin 301
Monday 3:35-6:35

Instructor: Ryan Bakker
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Office Hours: M TH 1:00-3:00 or by appt.

This course builds on the material learned in POLS 7012. In 7012, you learned the basics of data analysis in the social sciences including measures of central tendencies and dispersion, graphical summaries of variables, probability distributions, confidence intervals, t-tests, and hypothesis testing. This course will expand on many of these ideas and provide an in-depth understanding of the linear model—the workhorse of statistical inference in the social sciences and beyond. Throughout the semester we will learn the basic assumptions of the linear model, methods for transforming data, estimation and interpretation of the classical linear model, derivations of the estimators of interest, and diagnostics of results and/or potential fixes for violations of assumptions. This course will be considerably more mathematically intensive then 7012 in that we will also cover some matrix algebra and derivative calculus, as these tools are necessary to understand the inner-workings of the linear model. This course also lays the foundations for more advanced statistical modeling techniques used in the social sciences and covered in POLS 7050.

Grading:

The assignment of grades will be based on homework, two exams and a research project.

Homework: 25%
Midterm: 25%
Final Exam: 25%
Project: 25%

Attendance is a basic minimum for this course—points are not awarded for attending, but your grade may be lowered if absences/tardiness becomes a problem. Both the midterm and the final will be administered 'in class' on the dates specified in this syllabus. Since the dates of the two exams are set, there will be no make-up exams.

        Homework will be assigned several (5-7ish) times during the semester, each assignment worth 100 points and totaling 25% of the final grade. You will have one

week to complete the assignments. Late assignments will receive a penalty of 10 points for each day they are late. You may work in groups when completing your assignments, but the finished assignments must reflect your own, individual interpretations of the results. **DO NOT HAND IN THE EXACT SAME HOMEWORK AS ANYONE ELSE**—this will result in both (or all) assignments receiving a zero.   Some assignments will have different guidelines which will be made clear in advance.

The research project will require you to find a data set of interest to you and to pose an interesting, testable hypothesis. You will then analyze this hypothesis using the tools you learn in this course—specifically ordinary least squares (OLS) regression. Ideally, this will build off of the work you did in previous semesters. The finished product should be no more than 15 pages (double-spaced). I will provide more details on this assignment later in the semester.

The final grade will actually only consist of your HW scores and the 2 highest grades of your midterm/final/project. This, in essence, makes the final or the project optional, depending on how you have done on the HW and the midterms.

Text and Materials

There are two required texts for the course:

J. Fox, *Applied Regression Analysis, Generalized Linear Models, and Related Methods, Second Edition*. Newbury Park, CA.: Sage 2008.

J. Fox, *An R and S-Plus Companion to Applied Regression*. Newbury Park, CA: Sage, 2002

Agresti and Finlay, Stastistical Methods for the Social Sciences. Any edition.

A calculator will also be required. Graphing calculators will NOT be allowed. The calculator can be very simple, just make sure it has a square root function (squaring and factorial function keys will also be very helpful).

Software

We will be using R in this course, although at times I may make references to Stata. R is an infinitely flexible piece of statistical computing software and is available for FREE online at:

http://cran.r-project.org/

You are expected to have R installed on your machine by the second week of class.

Academic Honesty

All academic work must meet the standards contained in "A Culture of Honesty." Students are responsible for informing themselves about those standards before performing any academic work.

The link to the more detailed information about academic honesty can be found at:

http://www.uga.edu/ovpi/honesty/acadhon.htm.

Course Schedule:

Week 1:   Hello and Introduction

Week 2:   Sampling and Probabililty Distributions
              A&F Chs 1 - 4

 Week 3: MLK HOLIDAY

Week 4: Statisical Inference
                  A&F Chs 5-6

Week 5: Comparison of Two Groups/Association of Categoricial Variables
                  A&F Chs 7-8

Week 6: Examining and Transforming Data
                  AR Chs 1-3. CAR Chs 1-3

Week 7: Linear Least Squares Regression /Matrix algebra review
                  AR Ch 5, CAR Ch 4

Week 8: Statistical Inference for Regression & Matrix Algebra Quiz.
                  AR Ch 6.

Week 9: Dummy Variable Regression
                  AR Ch 7, CAR Ch4 (sec 4.2)
                  ****MUST HAVE DATA FOR PROJECT IN R FORMAT****

 Week 10: SPRING BREAK

Week 11 : Analysis of Variance and Review
                  AR Ch 8, CAR Ch 4 (sec 4.3)

Week 12: Regression Diagnostics I
                  AR Ch 11, CAR Ch 6 (section 6.1)

Week 13: Regression Diagnostics II
                  AR Ch 13 & 22 (sec 22.1 22.3), CAR Ch 6 (sec 6.5)

Week 14: Regression Diagnostics III
                  AR Ch 12, CAR Ch 6 (sec 6.2-6.4)

Week 15:   Review/Catch-Up and Thinking Ahead to POS 7050

Week 16:   Final Exam in class--April

May 5 :   Projects due in my box by 5:00 p.m. NO ELECTRONIC COPIES!!!

Note: The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary. We may not cover all of these topics. Conversely, time permitting, other topics might be covered in this course.