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|----------------------------|--------------------------------|-------------------------------|
| POLS 8501                  | Advanced Quant. Methods I      | Fall 2021                     |
| T 3:55-6:40                | Baldwin 104                    | Prerequisites: POLS 7012/7014 |
| Danny Hill                 | Dept. of International Affairs | dwill@uga.edu                 |
| Office Hrs: By appointment | Office: 319 IA Building        |                               |

## Course Description

This course presents students with an overview of regression analysis as it is commonly used in political science. The emphasis of the course is on models where the traditional assumptions of ordinary least-squares regression are violated because the dependent variable is non-continuous. The course focuses on maximum likelihood estimation of various models for discrete response variables, including binary, ordered, and nominal variables, event counts, and durations. Despite the course title, the models covered are among the most widely used in political science today. It is very difficult to produce or consume quantitative research in political science without some familiarity with these models. While course readings provide clear presentations of the models, much of the material in this course is technical and will require several readings (and hands-on experience) to fully comprehend. Because reading books and articles and attending lectures is not sufficient to learn how to perform statistical analysis competently, students will be required to complete lab exercises during most weeks. Special attention will be given to estimation and post-estimation analysis using the statistical software program R. Students will apply various models to different sets of data in a series of computer lab assignments, and to data relevant to their own area of specialization in a final paper to be submitted at the end of the semester.

## Required Texts

Ward, Michael D. and John Ahlquist. 2018. *Maximum Likelihood for Social Science*. New York: Cambridge University Press.

Long, Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks, CA: Sage Publications. (I will provide an electronic copy)

## Grades

Your grades will be based on lab assignments, a final paper, and class attendance/participation. Your final grade will be determined as follows:

Lab assignments (8): 40%

Final paper: 60%

Grade Distribution:

|           |                 |          |
|-----------|-----------------|----------|
| 90-100: A | 80-89: B        | 70-79: C |
| 60-69: D  | 59 and below: F |          |

## Lab Exercises/Homework Assignments

Students will complete 8 lab assignments throughout the semester. The assignments will require students to use the statistical software program R, which is open-source and completely free. We will spend a lot of time in class going through example code, and I will meet with the class via zoom once per week (time TBA) to answer any questions you have about assignments. Assignments are due Friday by 5 p.m. the week they are assigned.

## Final Paper

For your final paper, you are expected to write a paper that you could present without embarrassment at a professional conference. The paper can be on any topic in political science but must include a *complete* analysis using one of the techniques covered in this course. This means your research question must be amenable to off-the-shelf data (that you could download right now), assuming you have not collected relevant data yourself before the course begins. For this project you are strongly encouraged to extend/finish seminar papers or other projects you have already begun. You may also use a paper you are writing for another seminar in which you are currently enrolled, though you should get approval from the instructor of that course.

There are a few dates you need to remember with respect to the final paper. You must submit to me via email a 1-2 page paper proposal by Friday, September 24th. The proposal should outline your research question, argument, and the analysis you plan to conduct. I will then set up individual meetings with each of you to discuss your paper proposals. By Friday, October 29th you must submit a rough draft of the *research design* portion of your paper, meaning everything except the analysis. Your research design draft should include a description of the data you plan to analyze. On November 23rd I will again meet with each of you individually to discuss progress on your final paper and any problems you might be encountering with your analysis. All analysis must be conducted in R, and students must submit replication files (a script and a data file) along with their papers. Final papers are due December 13 by 5 p.m.

## Course format

The course is scheduled to be in person, but if you have underlying health conditions or do not feel comfortable attending for any other reason, please contact me.

## Course Website and Email

Can be accessed through [www.elc.uga.edu](http://www.elc.uga.edu). You will need to check this site regularly for any syllabus updates or for posted readings. Announcements may also be sent out via email. It is your

responsibility to check ELC for syllabus updates.

## Syllabus Change Policy

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

## Students with Disabilities

Students with disabilities who require reasonable accommodations in order to participate in course activities or meet course requirements should contact the instructor or designate during regular office hours or by appointment.

## University Honor Code/Academic Honesty Policy

As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, "A Culture of Honesty," and the Student Honor Code. All academic work must meet the standards described in "A Culture of Honesty" found at [www.uga.edu/honesty](http://www.uga.edu/honesty). Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

## Withdrawal Policy

Students who withdraw from the class before the withdrawal deadline are assigned a grade based on their performance (pass/fail) in the class up the point of withdrawal. This means that students who are failing will be assigned a "WF" grade even if they withdraw before the deadline. Students who withdraw from the class after the withdrawal deadline are automatically assigned a "WF" grade upon withdrawal.

## Course Schedule

### Aug 24: Course overview, introduction to R

No reading.

### Aug 31: Data management and basic statistics in R

No reading.

Lab 1 due Friday, Sep 3.

### Sep 7: Linear model review

Long, p. 1–25.

Lab 2 due Friday, Sep 10.

**Sep 14: Maximum likelihood estimation**

Ward and Ahlquist, ch. 1–2.

Long, p. 25–33, ch. 4.

Lab 3 due Friday, Sep 17.

**Sep 21: Models for binary response variables**

Ward and Ahlquist, ch. 3.

Long, ch. 3.

Paper proposals due Friday, Sep 24.

**Sep 28: Model evaluation and interpretation in R**

Ward and Ahlquist, ch. 6–7.

Lab 4 due Friday, Oct 1.

**Oct 5: Models for ordered response variables I**

Ward and Ahlquist, ch. 8.

Long, ch. 5.

**Oct 12: Models for ordered response variables II**

Ward and Ahlquist, ch. 8.

Long, ch. 5.

Lab 5 due Friday, Oct 15.

**Oct 19: Models for nominal/unordered response variables**

Ward and Ahlquist, ch. 9.

Long, ch. 6.

Lab 6 due Friday, Oct 22.

**Oct 26: Models for event counts I**

Ward and Ahlquist, ch. 10.

Long, ch. 8.

Research design draft due Friday, Oct 29.

**Nov 2: Models for event counts II**

Ward and Ahlquist, ch. 10.

Long, ch. 8.

Lab 7 due Friday, Nov 5.

### **Nov 9: Models for durations I**

Ward and Ahlquist, ch. 11.

### **Nov 16: Models for durations II**

Ward and Ahlquist, ch. 11.

Lab 8 due Friday, Nov 19.

### **Nov 23: Final paper discussions**

No reading, I will meet with each of you individually.

### **Dec 30: Model fit, validation, and prediction**

Ward and Ahlquist, ch. 5.

Ward, Greenhill, and Bakke. 2010. "The Perils of Policy by p-value." *Journal of Peace Research* 47(4): 363–375

FINAL PAPER DUE: Friday, Dec 13, 5 p.m.

## **COVID-19 Information for Students**

If you have underlying health conditions or are uncomfortable attending class in person for any reason, please contact me.

### **Face coverings**

Following guidance from the University System of Georgia, face coverings are recommended for all individuals while inside campus facilities. I'll be wearing one.

### **How can I obtain the COVID-19 vaccine?**

Please get vaccinated if you haven't already. University Health Center is scheduling appointments for students through the [UHC Patient Portal](#). Learn more [here](#). The Georgia Department of Health, pharmacy chains and local providers also offer the COVID-19 vaccine at no cost to you. To find a COVID-19 vaccination location near you, please go [here](#). In addition, the University System of Georgia has made COVID-19 vaccines available at 15 campuses statewide and you can locate one [here](#).

### **What do I do if I have COVID-19 symptoms?**

Students showing COVID-19 symptoms should self-isolate and schedule an appointment with the University Health Center by calling 706-542-1162 (Monday-Friday, 8 a.m.-5p.m.). Please DO NOT walk-in. For emergencies and after-hours care, see the information [here](#).

## **What do I do if I test positive for COVID-19?**

If you test positive for COVID-19 at any time, you are required to report it through the DawgCheck Test Reporting Survey. We encourage you to stay at home if you become ill or until you have excluded COVID-19 as the cause of your symptoms. UGA adheres to current Georgia Department of Public Health (DPH) quarantine and isolation guidance and requires that it be followed. Follow the instructions provided to you when you report your positive test result in DawgCheck.

### **Guidelines for COVID-19 Quarantine Period (As of 8/1/21; follow DawgCheck or see DPH website for most up-to-date recommendations)**

Students who are fully vaccinated do not need to quarantine upon exposure unless they have symptoms of COVID-19 themselves. All others should follow the Georgia Department of Public Health (DPH) recommendations: Students who are not fully vaccinated and have been directly exposed to COVID-19 but are not showing symptoms should self-quarantine for 10 days. Those quarantining for 10 days must have been symptom-free throughout the monitoring period and continue self-monitoring for COVID-19 symptoms for a total of 14 days. You should report the need to quarantine on [DawgCheck](#), and communicate directly with your faculty to coordinate your coursework while in quarantine. If you need additional help, reach out to Student Care and Outreach ([sco@uga.edu](mailto:sco@uga.edu)) for assistance.

## **Well-being, Mental Health, and Student Support**

If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit [their webpage](#). They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services. UGA has several resources to support your well-being and mental health. Find out more [here](#).

[Counseling and Psychiatric Services](#) (CAPS) is your go-to, on-campus resource for emotional, social and behavioral-health support. See also the [Therapy Assistance Online Support](#) site (TAOS), or call 706-542-2273 for 24/7 support . For crisis support see [this page](#). The University Health Center offers FREE workshops, classes, mentoring and health coaching led by licensed clinicians or health educators. See [here](#) for more.