Political Science by the Numbers (GOVT367)

Professor: Yamil R. Velez

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Office Hours: 1-2 PM on Thursday and by appointment.

Office Location: Room 213 in the Public Affairs Center.

Course Overview: This course provides an advanced introduction to probability theory and statistics. The main purpose of this course is to promote the understanding of statistical concepts and how these concepts can be used to understand the political world. Topics include probability distributions, correlation analysis, linear regression, generalized linear models, maximum likelihood, logistic regression, causal inference, experiments, and non-parametric modeling. Every week, there will be a lecture and lab on Tuesday and Thursday, respectively.

Course Structure and Expectations: This course will involve a mixture of lecture, applied lab exercises, original statistical analyses, and discussion. Lectures will cover theory and applied exercises will involve applying theoretical concepts to real world problems. Students are expected to attend class, participate in discussion, finish assigned readings, complete statistical problem sets, and participate in a collaborative research project.

Course Objectives: By the end of the course, students will:

- Understand the mathematical foundation of statistics
- Be able to apply and justify the use of statistical models
- Be able to describe uncertainty in quantifiable political outcomes
- Interpret results from statistical models
- Design and analyze social science experiments


Course Outline:

- **Week 1**: Why Statistics?
  - Gailmard (Chapter 1)
  - King (1990)*
  - Lindley (2000)*

- **Week 2**: Politics by the Numbers: Measurement, Description, and Uncertainty
  - Gailmard (Chapter 2)

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1If those words scare you, don’t worry. You will understand what they mean as we go through the course.
2There are exceptions to this rule (e.g. our first class).
3All articles will be made available on the course’s NotaBene site.
4Recommended readings are indicated by a *. 
- Bollen (1990)*
  - Gailmard (Chapter 3)*

- **Week 3**: Foundations: Set Theory and Probability Theory
  - Gailmard (Chapter 4.1-4.3)
  - Carothers (2015)

- **Week 4**: Distribution Functions: Visualizing Uncertainty
  - Gailmard (Chapter 4.4-4.7)

- **Week 5**: Pick a Number, Any Number (But Pick The Best One): Data Summaries
  - Gailmard (Chapter 5)
  - Kriner (2006)

- **Week 6**: Thinking Inside the Box: Discrete Data and Data Generating Processes
  - Gailmard (Chapter 6.1-6.4)

- **Week 7**: Smooth Transitions: Continuous Data and Data Generating Processes
  - Gailmard (Chapter 6.5-6.10)

- **Week 8**: Why Blood Tests Don’t Kill You: Sampling Theory
  - Gailmard (Chapter 7)

- **Week 9**: Beyond Reasonable Doubt: Hypothesis Testing
  - Gailmard (Chapter 8)

- **Week 10**: Best Guesses and Ignorance: Point and Interval Estimation
  - Gailmard (Chapter 9)
  - Enten (2015)

- **Week 11**: Just Cause: Causal Inference and Model Dependence
  - Gailmard (Chapter 10)
  - Freedman (2008)

- **Week 12**: Accepting Defeat: Non-Parametric Models and Tests
  - Beck and Jackman (1988)

- **Week 13**: Social Data: Web Scraping and Big Data
  - Barbera (2014)

- **Week 14**: Read Between the Lines: Text Analysis
  - Blei (2011)
Grade Breakdown:

1. Exam (30%): One take-home final exam worth 30% involving applied data analysis.

2. Class Research Project (30%): Throughout the course, we will collectively design and analyze a data set. This will help make some of the abstract concepts we cover in class more tangible. I expect everyone to contribute to this project.

3. Problem Sets (20%): Every week, I will assign a small problem set. Problem sets must be turned in prior to Tuesday's class the following week.

4. Participation (20%): Participation in the course will be determined by your engagement in class and outside of it.

Readings: All of the readings will be posted on the class Trello.

Extra Help: Students are expected to hand in their own work. Do not hesitate to come to my office during office hours to discuss an assignment or any aspect of the course.

Late Work: Late research paper assignments will lose 2/3 of a letter grade (e.g., a B+ becomes B-) for each day they are late. An assignment is considered one day late if it is submitted more than 10 minutes after the stated deadline. The assignment becomes two days late 24 hours after the deadline, 3 days late after 48 hours, 4 days late after 72 hours, and 5 days late after 96 hours. Assignments over five days late will not be accepted for credit.

Contacting the Instructor: I encourage you to contact me with questions and concerns about the course content and assignments. Please refer to me as Professor Velez in all correspondence. In general, if you have a clarification question you can reach me over e-mail. Questions about course material, grades, or how to structure your research paper are best dealt with in office hours where we can have a more productive conversation than over e-mail. If my office hours do not work for you because of your class schedule, work schedule, or another important commitment, I am also available by appointment. I cannot guarantee that if you e-mail me shortly before an assignment is due that I will be able to answer your questions, so please make sure and e-mail me early if you have a time-specific question.

Contested Grades: If you wish to contest a grade you must submit a written explanation of why you believe the grade is inaccurate within two weeks of getting the assignment back. You must wait 24 hours from the time the assignment is returned before you submit the written explanation. I will not discuss grades until 24 hours after the assignment is passed back. If you ask me to reevaluate your grade then I reserve the right to either raise or lower your grade based on my reevaluation. This policy is meant to address disagreements with my assessment of your work. It does not pertain to calculation errors on my part. If you believe I have made a mistake adding up points, converting your points to a percentage, etc. you can let me know immediately, and I will be happy to correct any mistakes.

Accommodations for Students with Disabilities: Wesleyan University is committed to ensuring that all qualified students with disabilities are afforded an equal opportunity to participate in and benefit from its programs and services. To receive accommodations, a student must have a documented disability as defined by Section 504 of the Rehabilitation Act of 1973 and the ADA Amendments Act of 2008, and provide documentation of the disability. Since accommodations may require early planning and generally are not provided retroactively, please contact Disability Resources as soon as possible. If you believe that you need accommodations for a disability, please contact Dean Patey in Disability Resources, located in North College, Room 021, or call 860-685-2332 for an appointment to discuss your needs and the process for requesting accommodations.

Technology in the Classroom: You may only use computers in the lab. Refrain from using these
devices for Facebook, instant messenger, e-mail checking, or anything else that may distract you, your fellow students, or me. Texting is not permitted during class.

**Academic Integrity:** Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person’s work as your own is always wrong. I expect students to follow the Wesleyan honor code and will report any cases of academic dishonesty to the Honor Board.

Please read this for more information: [Wesleyan Honor Code](#)

For information on plagiarism: [Plagiarism, Student Handbook](#)

**Title IX:** Title IX of the Education Amendment of 1972 states that no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. See [Title IX at Wesleyan](#) for more information.

**Syllabus:** Note that this syllabus is a rough guide and subject to change.