Applied Statistics (POL 202)

Winter 2025

TR 11:20 am -12:50 pm, James G. Leyburn Library 223

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Office Hours: Tuesdays 09:00 am -11:00 am
Thursdays 03:00pm - 05:00 pm

Course Description

In this course, you will develop the skills to analyze data, draw meaningful conclusions from your analyses, critically evaluate results, and present evidence-based opinions about politics.

Throughout the semester, you will explore fundamental concepts in statistics and probability while learning methods to achieve these objectives. More specifically, you will learn how to operationalize and measure concepts, as well as examine the challenges and limitations of collecting high-quality data. A central focus of this course is on critically assessing conclusions drawn from data—whether in academic research, media reports, political discourse, or policy advocacy.

We will use a flipped classroom approach, dedicating most class time to hands-on application of statistical methods through online and in-class lab exercises.

Course Objectives

- Summarize data effectively using descriptive statistics and present findings through clear and meaningful graphical techniques.
- Interpret and critically assess statistical results across various applied examples.
- Build a foundational understanding of common challenges and pitfalls in data collection and sampling.

Course Main Policies

- **Electronics Policy**: Except for Thursdays, the use of electronics in class is not permitted. Activities such as chatting, texting, playing online games, or reading unrelated material are disrespectful to both Prof. F and your classmates. Take notes using paper or notebooks during these sessions.

- **Attendance Policy**: Attendance is not mandatory. As adults, you are responsible for managing your own obligations. However, class participation is graded each session, and some class content will be included in evaluations. It is your responsibility to manage absences and address any impact on your grades.
- **Class Requirements**: Bring your laptop to class every Thursday. Online courseware and software will be integral to our work. If you do not have access to a laptop, you may request one through the Laptop Lending Program. If you are unfamiliar with using computers, please let me know so I can provide assistance.
- **Required Materials**: Purchase the online textbook (CMU coursework) and the software (StatCrunch), as they are essential for both in-class and at-home lab activities.

Course Evaluation

	Activity's Weight
Checkpoints (Quizzes)	10%
At-home Labs	30%
Midterm Exam	20%
Final Exam	30%
Participation	10%
Total	100%

Grade Distribution

Excellent	A: 94-100	A- : 90-93	
Good	B+ : 87-89	B : 84-86	B- : 80-83
Fair	C+ : 77-79	C : 74-76;	C- : 70-73
Poor	D+ : 67-69	D : 64-66;	D- : 61-63
Fail	F : 60 and >		

Checkpoints

The weekly open-book online "Checkpoints" consist of multiple-choice questions administered through our online courseware. You are required to complete two attempts for each checkpoint, with the highest score counting as your final grade. Failure to complete the second attempt will result in a score of zero for that attempt, which will be averaged with your first attempt.

Checkpoints are typically due on Thursdays at 11:59 PM. These quizzes are designed to encourage consistent study of course material throughout the semester rather than cramming for the midterm or final exams.

At-Home Labs

Each week, you will complete graded online labs that include cases, problems, and questions designed to assess your statistical skills and comprehension of the assigned material. These labs are due on Sundays at 11:59 PM. During in-class labs, Prof. F will guide you through exercises similar to the at-home labs, providing preparation and support to help you successfully complete the assignments.

Exams

- **Midterm Exam**: The Midterm Exam will consist of two parts. The **written portion** will take place in class on **Thursday, February 20th**, while the **computer-based portion** will be available on Canvas from **Thursday, February 20th, at noon**, until **Sunday, February 23rd, at 11:59 PM**.
- **Final Exam**: The Final Exam, held during finals week, will also include both a **written portion** and a **computer-based portion**, both of which must be completed during finals week.

Participation

On Thursdays, we will focus on a specific topic related to the politics of a world region or country and discuss biases we may hold about them, exploring how statistical tools can help validate or challenge these biases. Prof. F will provide exercises related to the week's topic for students to solve in class under supervision. At the end of the class, we will hold a discussion session where students share their findings and demonstrate how statistical methods have enhanced their understanding of world politics.

Participation in these Thursday sessions is important, but active engagement during regular classes is also key to your success in this course. Students are expected to read the assigned materials before each class and actively participate at least once a week.

Participation will be assessed based on the quality, not (only on) the quantity, of your contributions. Thoughtful and well-prepared input is valued over frequent but less substantive comments.

Disability Accommodations

The University makes reasonable academic accommodations for qualified students with disabilities. All accommodations must be approved through the Office of the Dean of the College.

- **Students requesting accommodations for this course should present an official accommodation letter** within the first two weeks of the term and schedule a meeting outside of class time to discuss accommodations. It is the student's responsibility to present this paperwork in a timely fashion and to follow up about accommodation arrangements.

Diversity Statement

The University affirms that diverse perspectives and backgrounds enhance our community. We are committed to the recruitment, enrichment, and retention of students, faculty, and staff who embody many experiences, cultures, points of view, interests, and identities. As

engaged citizens in a global and diverse society, we seek to advance a positive learning and working environment for all through open and substantive dialogue. Please read the Politics Department Statement on Diversity and Inclusion.

Policy on Prohibited Discrimination

The University prohibits and this policy addresses discrimination, including harassment, on the basis of race, color, religion, national or ethnic origin, age, disability, veteran's status, and genetic information in its educational programs and activities and with regard to employment. Additionally, the University prohibits retaliation against any individual who brings a good faith complaint under this policy or is involved in the complaint process. Students, faculty, and staff found to have violated this policy will be disciplined appropriately, up to and including termination from employment or dismissal from the University.

Sexual Discrimination & Misconduct Policy

The University prohibits all forms of sexual misconduct-which includes sexual harassment, non-consensual sexual intercourse, non-consensual sexual contact, sexual exploitation, domestic and dating violence, and stalking-and retaliation. This policy provides guidance to assist those who have experienced or been affected by sexual misconduct, whether as a complainant, a respondent, or a third party. It includes detailed information about what conduct is prohibited, confidential and reporting resources, and resolution procedures.

Course Materials

1) Online **courseware application from Carnegie Mellon University (CMU)** as our **textbook.** Access cards available online or at the W&L Store. Please pay special attention to the course key: intr202zpf25
2) Online software package **StatCrunch.** Access code available at https://www.statcrunch.com/register/student
    - Use of R-studio is optional for those students who feel comfortable with this software. Please inform or coordinate with Prof F in case you decide to work with R.

As you can see, payment, registration, and login are required to access both materials.

List of Assignments and Due Dates

- **Checkpoints** will be available every **Friday** at 12:00 a.m., after the due date for the previous Checkpoint has passed
- **At-home Labs** will be available every **Monday** at 12:00am

Week	Topic	Textbook Readings	Assignments	Assignment's due dates
Week 1 (Jan 9-12)	**Class Introduction (No assignments)**			
Week 2 (Jan 13-19)	**Distributions**	· M3 The Big Picture · M4 Examining Distributions (omit p.23)	· Distributions Checkpoints 1 & 2	Thursday, Jan 16 at 11:59pm on CMU courseware
			· Practice Lab	Sunday, Jan 19 at 11:59pm on Canvas
Week 3 (Jan 20-26)	**Relationships, Sampling, and Design**	· M5 Examining Relationships · M6 Sampling · M7 Designing Studies	· Relationships Checkpoints 1 & 2 · Sampling Checkpoint · Designing Studies Checkpoints 1 & 2	Thursday, Jan 23 at 11:59pm on CMU courseware
			· Lab 1	Sunday, Jan 26 at 11:59pm on Canvas
Week 4 (Jan 27-Feb 2)	**Probability and Random Variables**	· M8 Introduction (Probability) · M9 Probability & Random Variables	· Intro to Probability Checkpoint · Random Variables Checkpoint	Thursday, Jan 30 at 11:59pm on CMU courseware
			· Lab 2	Sunday, Feb 2 at 11:59pm on Canvas

Week 5 (Feb 3-9)	**Sampling Distributions**	· M10 Sampling Distributions	· Sampling Distributions Checkpoints 1 & 2	Thursday, Feb 6 at 11:59pm on CMU courseware
			· Lab 2	Sunday, Feb 9 at 11:59pm on Canvas
Week 6 (Feb 10-16)	**Inference and Estimation**	· M11 Intro (inference) · M12 Estimation	· Estimation Checkpoint	Thursday, Feb 13 at 11:59pm on CMU courseware
			· Lab 4	Sunday, Feb 16 at 11:59pm on Canvas
Week 7 (Feb 17-23)	**Midterm Exam (ME): No assignments** In-class review: Tuesday, Feb 18 in class ME Written: Thursday, Feb 20 in class ME in computer: From Thursday, Feb 20 to Sunday, Feb 23			
Week 8 (Feb 24-Mar 2)	**Winter Break**			
Week 9 (Mar 3-9)	**Hypothesis Testing I**	· M13 Hypothesis Testing I (p.146-174)	· Overview Checkpoint · HT for a Population Proportion Checkpoint · Mean Checkpoint	Thursday, Mar 6 at 11:59pm on CMU courseware
			· Lab 5	Sunday, Mar 9 at 11:59pm on Canvas
Week 10 (Mar 10-16)	**Hypothesis Testing II**	· M13 Hypothesis Testing II (p.175-177)	· Hypothesis Testing Checkpoint · Type I and II Checkpoints	Thursday, Mar 13 at 11:59pm on CMU courseware
			· Lab 6	Sunday, Mar 16 at 11:59pm on Canvas
Week 11 (Mar 17-23)	**Hypothesis Testing for Relationships I**	· M14 Inference for Relationships I (p.178-196)	· Two Samples Checkpoint · Matched Pairs Checkpoints	Thursday, Mar 20 at 11:59pm on CMU courseware

			· Lab 7	Sunday, Mar 23 at 11:59pm on Canvas
Week 12 (Mar 24-30)	**Hypothesis Testing for Relationships II**	· M14 Inference for Relationships II (p.197-203)	· ANOVA Checkpoint	Thursday, Mar 27 at 11:59pm on CMU courseware
			· Lab 8	Sunday, Mar 30 at 11:59pm on Canvas
Week 13 (Mar 31-Apr 6)	**Inference for Relationships Continued**	· M15 Inference for Relationships Continued	· C->C and Q->Q inferences	Thursday, Apr 3 at 11:59pm **on Canvas**
			· Lab 9	Sunday, Apr 6 at 11:59pm on Canvas
Week 14 (Apr 7-11)	**Introduction to Bivariate and Multivariate Regressions**	· Alan Agresti, Statistical Methods for Social Sciences (Pearson, 2018), Chapters 9, 10, and 11	· Review of Univariate and Multivariate Regressions	Thursday, Apr 10 at 11:59pm **on Canvas**
			No At-home Lab	X
Week 15 (Apr 12-18)	**Final Exam (No classes, no assignments)**			