# Inferential and Multivariate Statistics

[SOC8211; Section 001, Fall 2025]

## Basic Course Information

### Meeting Time and Location

M 2:00-4:30 Gladfelter 847

### Emergency meetings

In the event that we are unable to meet in person, expect a Canvas announcement directing you to a Zoom meeting.

## Instructor Information

Associate Professor Joshua Klugman

Please refer to me as “Josh” or if you prefer to stand on formality, “Mr. Klugman” or “Professor Klugman”.

My pronouns are he/him/his.

### Instructor Biography

I earned my PhD in sociology in 2007 at Indiana University. I joined the departments of Sociology and Psychology at Temple in 2007. I am a sociologist of education and primarily use quantitative methods for my research. At Temple I primarily teach statistics in both Psychology (graduate students) and Sociology (undergraduate and graduate students). Statistical research is a major way of knowing our social world and I am looking forward to introducing you to these methods that you can apply to your own research.

### My Contact Information

The best way to reach me is through email: [klugman@temple.edu](mailto:klugman@temple.edu) or through the Canvas discussion forums. Please do not pose urgent or important questions through the Canvas Grader.

### Communication Policy

I believe in an equitable flow of information; that is, if a student asks me a question about course content, assessments, or policies that other students would benefit from, I will share the answer on the discussion forum.

**I assume that you will see any announcement or discussion forum post I make. You should set your Canvas notifications to get emails about discussion forum posts. I suggest you check Canvas and your e-mail account daily so you do not miss any special announcements made outside of normal class hours.**

### My Office

Gladfelter 763

Zoom: <https://temple.zoom.us/j/2152199107>

**I set aside 11-12:30 on Mondays and 12:30-2:00 on Wednesdays for office hours**. During these times, you can come by my office or Zoom with no appointment necessary. I am also available by appointment.

## Purpose of the Course

### Overview of the Course

This course will introduce you to statistical techniques that most quantitative sociologists use in their research. We will start off learning statistical basics and then drill down into linear regression, multiple regression, and, time permitting, logistic regression. You will learn how to do these statistical techniques in R which will be covered in the lectures.

### Prerequisites

I assume that all students have taken an undergraduate introductory statistics class. If this does not apply to you please see me as soon as possible so we can talk about what you can do to make sure you do not get lost.

### Learning Goals

Upon successful completion of this course, you will be able to…

* Perform data management in R
* Calculate and interpret descriptive statistics of data
* Calculate and interpret basic bivariate relationships between variables
* Perform and understand statistical inferences
* Run and interpret multiple regressions

## The Learning Environment

### How Class Will Be Conducted

**Class Zoom:** <https://temple.zoom.us/j/97649661716>

Class will be conducted in-person. I will stream the class via Zoom for people who cannot make it to class. However, my instruction will be focused on the people in the physical classroom. Attending class via Zoom should be considered a last resort option, and in all likelihood will be an inferior learning experience. In emergencies, I may have to teach the class via Zoom and in that case I will pose an announcement to Canvas.

Class sessions will be a mixture of lectures and exercises involving R.

I ask that for at least the first few sessions that you do the R exercises using the lab computers, so I do not have to troubleshoot issues with operating systems and directory pathways.

### Materials

There is no required textbook for the class. I will make my lecture notes available, and there will be a handful of articles that will be available online.

You should download the latest versions of R (4.5.1, "Great Square Root") and RStudio (2025.05.1+513) to the computer(s) you will use for this class. This software is free.

You will probably find it easiest to do assignments at home on a desktop or laptop, and the software to do the assignments is free (R and RStudio are free downloads; and Temple students should have free access to Microsoft Office).

### Accessibility

Any student who has a need for accommodations based on the impact of a documented disability or medical condition should contact Disability Resources and Services (DRS) located in the Howard Gittis Student Center South, 4th Floor at drs@temple.edu or 215-204-1280 to request accommodations and learn more about the resources available to you. If you have a DRS accommodation letter to share with me, or you would like to discuss your accommodations, please contact me as soon as practical. I will work with you and with DRS to coordinate reasonable accommodations for all students with documented disabilities. All discussions related to your accommodations will be confidential. Students can learn more about the accommodation process and pre-register on the [DRS website](https://disabilityresources.temple.edu/register-drs). Students may register at any time during the semester, but accommodations are not active until you register, so I recommend doing so as early in the semester as possible.

### Resources and Support

I am required by Temple to post this list of resources that you may need. Except for University Libraries (which are pretty good!), I have not verified the accessibility nor quality of the services rendered nor their applicability to graduate students.

[Student Success Center](https://studentsuccess.temple.edu/)

[University Libraries](https://library.temple.edu/webpages/remote-learner-support)

[Career Center](https://www.temple.edu/life-at-temple/students/careers-and-internships/career-center)

[Tuttleman Counseling Services](https://counseling.temple.edu/access-services)

[Disability Resources and Services](https://disabilityresources.temple.edu/)

[Student Health Services](https://studenthealth.temple.edu/)

### Mandatory Reporter Statement

Like all instructors, I am a mandatory reporter, which means that if you disclose to me information about sexual misconduct involving a Temple student or employee I am required to transmit all of that information, including your name, to Temple University’s Title IX coordinator. As a student, however, you are **not** required to meet with or report anything the Title IX office. Students may speak to someone **confidentially** by contacting Student Health Services (215-204-3284) or Women Organized Against Rape (24 hours confidential; 215-985-3333).

## Course Schedule

(subject to change as we progress through the semester):

Miller (2004) reading – Miller, Jane E. 2004. *Chicago Guide to Writing About Numbers*. Chicago, IL: University of Chicago Press. On Canvas.

Table Course schedule

|  |  |  |
| --- | --- | --- |
| **Week** | **Day** | **Topic** |
| **1** | 08/25 | Introduction – Summary Statistics, Normal Distribution  Introduction to Inferential Statistics – Hypothesis Testing, Confidence Intervals Using Normal and *t* dist. |
| **3** | 9/8 | Inferential statistics Continued  READING: Miller (2004), “Types of Quantitative Comparisons” (on Canvas) |
| **4** | 09/15 | Comparing Means Across Two Groups independent & dependent *t* tests of sample means |
| **5** | 9/22 | Cross-Tabulations and Chi-Square  Miller (2004) “Writing About Distributions & Associations” (on Canvas)  **R Quiz** |
| **6** | 9/29 | Correlation  READING: Gelman and Carlin (2014), “Beyond Power Calculations: Assessing Type S (Sign) and Type M (Magnitude) Errors”. *Perspectives on Psychological Science* 9(6) 641-651. [dx.doi.org/10.1177/1745691614551642](http://dx.doi.org/10.1177/1745691614551642)  Gelman (2017), “The ‘What Does Not Kill My Statistical Significance Makes It Stronger’ Fallacy”. Blog entry, *Statistical Modeling, Causal Inference, and Social Science* February 6, 2017. <http://andrewgelman.com/2017/02/06/not-kill-statistical-significance-makes-stronger-fallacy/> |
| **7** | 10/6 | Simple Linear Regression |
| **8** | 10/13 | Nonlinear Effects in Regression |
| **9** | 10/20 | Nonlinear Effects in Regression  **EXAM 1** |
| **10** | 10/27 | Introduction to Multiple Regression |
| **11** | 11/3 | Introduction to Multiple Regression  Breen, Richard. 2022. “Causal Inference With Observational Data.” Pp 272-286 in *Handbook of Sociological Science*, edited by K. Gerxhani, N. de Graaf, and W. Raub. <https://doi.org/10.4337/9781789909432.00024> |
| **12** | 11/10 | Multiple Regression Strategies  Perry, Samuel L. 2025. “How Christian Nationalism Promotes White Supremacy: An Examination of Racial Stereotypes.” *Sociology of Race and Ethnicity*. <https://doi-org.libproxy.temple.edu/10.1177/23326492251352804> |
| **13** | 11/17 | Multiple Regression Strategies  Abascal, Maria, and Denia Garcia. 2022. “Pathways to Skin Color Stratification: The Role of Inherited (Dis)Advantage and Skin Color Discrimination in Labor Markets.” *Sociological Science* 9: 346-373. https://sociologicalscience.com/articles-v9-14-346/ |
| **14** | 12/1 | Logistic Regression  Ward, Matthew. 2023. “Legacies of Resistance and Resilience: Antebellum Free African Americans and Contemporary Minority Social Control in the Northeast.” *Social Forces* 102(2): 496-516. <https://doi-org.libproxy.temple.edu/10.1093/sf/soad062> |
| **15** | 12/8 | Logistic Regression  Zhang, Letian. 2023. “Racial Inequality in Work Environments.” *American Sociological Review* 88(2): 252-283. https://doi.org/10.1177/00031224231157303 |
| **16** | 12/15 | **EXAM 2 MONDAY**  **1-3pm Gladfelter 847** |

## Grading and Assessment Guidelines

### Grading Scale

Table Grading Scale

|  |  |  |  |
| --- | --- | --- | --- |
| A | 94.0 - 100 | C | 74.0 – 76.9 |
| A- | 90.0- 93.9 | C- | 70.0 – 73.9 |
| B+ | 87.0 – 89.9 | D+ | 67.0 - 69.9 |
| B | 84.0 – 86.9 | D | 64.0 - 66.9 |
| B- | 80.0 – 83.9 | D- | 60.0 – 63.9 |
| C+ | 77.0 – 79.9 | F | <60.0 |

### Course Minimum Grade

A grade of a C- or better is required to get credit for this course. MA students in sociology need to earn a GPA of at least 3.0 (a “B” grade) or higher to get their degree. PhD students in sociology need to earn a GPA of a 3.4 (between a “B+” and “A-“ grade) in their coursework to continue in the program.

### Assessment Summary

Table Assessment Summary

|  |  |
| --- | --- |
| Lab Assignments | 65% |
| R Quiz | 5% |
| Exams (2, 15% each) | 30% |

### Lab Assignments

To hone your statistical skills and make you feel more comfortable using statistics, I require that you complete a number of lab assignments.

I encourage you to help one another on the lab assignments, although you should draw the line at looking at each other’s write-ups. Your grade is determined by how well you meet our expectations, not on your performance relative to others. However, we expect that the work you turn in is your own. Cheating will not be tolerated in this class.

You are required to turn in lab assignments on the days they are due. You have three “free days” where you can turn in one assignment three days late, or three assignments one day late. After you have reached the three day limit, I will deduct your assignment grade 25% for each day it is late. I will not accept assignments that are more than two days late.

### R Quiz

There will be a brief R quiz where you will be expected to do some simple R data management and analysis operations within a specified time frame.

### Exams

There will be two exams. Exam 2 is semi-cumulative in that it will focus on the material covered since the midterm but it may require you to use the tools you learned before then.

### Attendance Policy

This course does not have an attendance policy. You are adults, and if you miss class I will not penalize your grade. However, I encourage you to attend class in person. For most people, learning statistics is a challenge, and I have found that the most learning occurs in collective settings where one interacts with the instructor and fellow students. If you miss class, you are responsible for learning the content you missed as well as any other course materials/announcements.

## Technology Guidelines

### Technology Requirements

You do not need to buy any software to do well in this course. R and RStudio are available in all computer labs on the main campus. Anyway, this is free, open-sourced software that is easy to download and install on Mac and PC computers.

### Class Recordings

**I will turn Zoom on during all class sessions and you will have access to these recordings throughout the semester. However, watching the Zoom steam in lieu of attending class in person will result in an inferior learning experience**. Individuals are not permitted to record, copy, publish, or redistribute audio or video recordings of any portion of the session to individuals who are not associated with the university without the express permission of the host/faculty member and of any other meeting participants who are recorded. Distribution without permission could be a violation of various privacy laws, including [FERPA](https://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html), as well as Pennsylvania Wiretapping and Electronic Surveillance Control Act and possibly copyright law.

### AI policies

The use of generative AI tools (such as ChatGPT, Gemini, Microsoft CoPilot, etc.) is not permitted in this class; therefore, use of AI tools for work in this class may be considered a violation of Temple University’s [Academic Honesty](https://bulletin.temple.edu/undergraduate/about-temple-university/student-responsibilities/#academichonesty) policy and [Student Conduct Code](https://secretary.temple.edu/sites/secretary/files/policies/03.70.12.pdf), since the work is not your own. The only acceptable use of AI tools is to troubleshoot syntax for your lab assignments. The use of unauthorized AI tools will result in a failing grade on the assessment and a referral to Student Conduct.

## Academic Guidelines

### Statement on Academic Freedom

Freedom to teach and freedom to learn are inseparable facets of academic freedom. I have the freedom and responsibility to design and facilitate our learning environment to best achieve the promise of the course as outlined in its official description. You have the responsibility to engage with the course in good faith and freedom from mistreatment when your opinion differs from mine. Note that it is not abuse of this freedom for me to require that you support relevant opinions with clear argumentation and solid evidence. For more on academic freedom, consult the [official Temple policy](http://policies.temple.edu/getdoc.asp?policy_no=03.70.02) on the matter.

### Policy on Academic Honesty

Temple University believes strongly in academic honesty and integrity. Plagiarism and academic cheating are, therefore, prohibited. All work you submit for assessment should be your own efforts. For more on this topic, consult the relevant portions of [Temple Bulletin](https://bulletin.temple.edu/undergraduate/student-resources/student-rights-responsibilities/#studentresponsibilitiestext) and the [Student Conduct Code](https://secretary.temple.edu/sites/secretary/files/policies/03.70.12.pdf).