POLS 309: Polimetrics	**Spring 2026**
All sections (ILCB 111)	Tues. & Thur. 9:35–10:25am
Section 501 (Allen 2002)	Monday 9:40–10:30am
Section 502 (Allen 2003)	Monday 9:40–10:30am
Section 503 (Allen 2003)	Monday 10:50–11:40am
Section 504 (Allen 2002)	Monday 12:00–12:50pm
Section 506 (Allen 2002)	Monday 10:50–11:40am

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Catalog description

Polimetrics. (3-0). Credit 3. Theory, techniques, and application of quantitative analysis in political science; focus on quantitative techniques commonly used to evaluate empirical theories of politics. Prerequisites: POLS 209 and 9 additional hours of political science or approval of instructor.

Overview and outcomes

Data analysis, numeric literacy, and programming are increasingly in-demand and necessary skills. Mastering these skills requires a level of analytic thinking and precision that make you both more marketable in the workplace and a more well-rounded human being. This course builds on POLS 209 (a prerequisite) to provide more sophisticated tools for working with and analyzing data. Specifically, we will consider the theory, techniques, and application of quantitative political analysis, with a focus on the techniques

used to evaluate political theories and policy outcomes. In service of these goals, we will focus on **clearly** and **concisely** building arguments with data. By the end of the semester you should be able to:

1. define and understand important statistical concepts and method;
2. use the R programming language to complete homework assignments and conduct political/policy research;
3. interpret and evaluate statistical output;
4. effectively communicate the results of your data analysis to a lay audience.

This is a challenging course that includes **math**, **programming**, and **communication**. Many of you will find one or more of those things difficult. You need to be prepared to devote significant time outside of class to mastering this material (I can't stress this enough). It is very easy to fall behind in this class, please don't let it happen.

Prerequisites

POLS 209 and 9 additional hours of POLS courses.

Text books and course materials

Buy or rent the following book:

- Llaudet, Elena and Kosuke Imai. *Data Analysis for Social Science*.

Additionally, the below books/notes are available free online are will be used listed on Canvas along with other readings.

- Kenkel, Brenton. "Practical Data Analysis for Political Scientists." `https://bkenkel.com/pdaps/`
- Crisman-Cox, Casey. 2025. "One Day R Course." `https://github.com/ccrismancox/Rcourse/blob/main/short_course.pdf`

It may behoove you to find a simple book (or online resource) for R programming; some will be provided on Canvas. Additional readings will also be posted to Canvas.

Slides will be posted online after the lecture so you can look back on them to help answer questions and supplement your notes, please study them frequently and carefully. The slides will contain lots of pauses for you to try things on your own: take advantage of that. Students often ask for the slides ahead of time so that they can annotate them in pdf form. However, to encourage you to take proper notes (see below) I have decide to try inducing more incentives for you to take in-class notes.

Software

We will make frequent use of the R programming language this semester. Two reasons we like R:

1. it's the primary tool for applied statistics — it enjoys wide use in private, public, and academic settings;
2. it's free to download for any computer (Mac, Windows, or Linux) from `https://cloud.r-project.org/`.

Monday lab sessions will include lessons on developing and applying basic computer and R skills. This is an important part of the course and it will be very difficult to do well in the course if you do not attend lab (either in person or virtually).

Course Requirements

Evaluation is based on

- Homeworks (40%): Five equally weighted problem sets will be distributed throughout the semester. Answers to problem set questions will be typed and written in complete sentences. Handwritten problem sets will not be accepted. Answers that do not show (e.g., step-by-step math, R code) and describe work (e.g., 1 or more sentences describing your process and detailing your code) will be marked as zero. The lowest scoring problem set will be dropped for each student. Students will be taught how to export tables and figures from R to be used in their write ups. **All problem sets must be submitted in pdf or word format with an accompanying R code file.**
- Reports/exams (30% each): You will be given two exams that unfold over the course of 4 weeks. These exams take the form a written report

and are designed to give you practice at analyzing and presenting data to a client or other decision maker. By the end of the first week, you will complete and submit the baseline data analysis portion of your report (75 pts). This portion will be graded like a problem set with the caveat that you are expected to work alone on it. You will then have three weeks to write up your corrected results and submit the report along with your final corrected code (25 pts).

The topic of these exams will be a political issue (e.g., medicaid expansion, abortion, the minimum wage, racial disparities in policing, gun laws). We will consider these questions dispassionately and empirically; we are only interested in what the data do or do not tell us. You are neither required nor expected to espouse, endorse, or adopt any opinion or position on these issues, although you may be asked to offer, and justify, an opinion to a hypothetical decision maker based on the results of your analysis combined with outside reading.

The report should be no more than 5 double-spaced pages including tables and figures. A grading rubric will be uploaded to Canvas. Consult the APSA style guide for references and citation (also posted to Canvas). Use a standard 12pt font (e.g., Calibri or Times New Roman) with 1 inch margins.

All assignments are due by midnight on the assigned due date unless stated otherwise (e.g., the final exam). All assignments are to be submitted and will be returned using Canvas. A late assignment is penalized by 5 points for every 24 hours it is late. It will not be accepted after the assignment has been returned to the other students without express approval of the instructor or TA. These penalties are waived with either a university-approved absence or pre-negotiation with me or your TA. For more information, see Rule 7 (`https://student-rules.tamu.edu/rule07/`).

We are typically generous with flexibility on due dates so long as you tell us what's going on. However, it is not almost never in your interest to miss deadlines for this class (did I mention it's easy to fall behind?). Please do not abuse our flexibility.

Attendance, notes, and extra credit

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to Student Rule 7 in its entirety for information about excused absences, including definitions, and related documentation and timelines (`https://student-rules.tamu.edu/rule07/`).

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor. Please refer to Student Rule 7 in its entirety for information about makeup work, including definitions, and related documentation and timelines. Some particularly relevant points:

- "Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the time frame for make-up work should be agreed upon by the student and instructor" (Student Rule 7, Section 7.4.1).
- "The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" (Student Rule 7, Section 7.4.2).
- Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code (see Student Rule 24).

It will be very difficult (nearly impossible) to do well if you don't actively attend, listen, and participate in all class sessions. As such we offer two incentives for attendance and note taking:

1. 5 extra credit points will be given to any students with perfect attendance (including labs) with exceptions for approved absences granted. For each lecture or lab missed without an approved absence, you lose 1 of those points. Attendance is recorded using a sign-in sheet passed around during each class meeting.
2. At end of each month (1/31, 2/28, 3/31, 4/30), you may upload a scan/image of your written notes for that month to canvas for 1 point of extra credit each, plus 1 more if you do all four (up to five total points). If you have a disability that precludes writing in-class notes please reach out so we can negotiate other ways to assess your in-class involvement.

These lectures go much better for everyone if you engage and speak up when you have questions. Too often, students seem reluctant to ask in class, particularly in the first weeks of the semester. This is to everyone's detriment. Be a hero and ask us *every* question you have in real time, and we will do our best to get you through a tough course.

Grading

All grading is done by the Teaching Assistant. If an arithmetical error is discovered, you should inform your TA. However, if you wish to challenge a grade on anything, the following steps must be taken:

1. Email me (the professor) within 1 week of assignment being returned;
2. For each disputed element, the student must explain in complete, detailed sentences why the grade should be adjusted;
3. If I deem that there is enough ground for the challenge, I will re-grade the entire thing. Your grade may go up, down, or remain unchanged.

Final grades will be based on the above course requirements. The grading scale is based on 15 point blocks as follows:

$85 \leq x$	A
$70 \leq x < 85$	B
$55 \leq x < 70$	C
$40 \leq x < 55$	D
$x < 40$	F

Academic Integrity

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" (Section 20.1.2.3, Student Rule 20, `https://aggiehonor.tamu.edu/rules-procedures/sr20.html`).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at `https://aggiehonor.tamu.edu/`.

AI statement

AI can be very useful as a study aid, particularly if the instructors are unavailable or if you want a different perspective. I encourage you to use ChatGPT or other similar forms of AI for asking questions like:

1. How to do [X] in R? (e.g., how to I create a histrogram in R?)

2. What is [X]? (e.g., what does bias mean in statistics?)

Obviously, you should **not** use generated AI output (either verbatim or with minimal rewrites) for your write ups and explanations. You *can* use AI to help you understand concepts that you can rewrite in your own words. Note, that if code output works for you and is correct, you don't need to rewrite that; this goes with other code you may find online (e.g., from stackoverflow), but you *do* need to explain what it does in your code comments.

If your TA suspects that you have inappropriately claimed AI output as your own or out-right plagiarized then I have little choice but to involve the Aggie Honor System Office. So please, be smart and be careful. Always write things in your own words. Treat AI like you would any other source and do not do anything remotely close to plagiarism.

Writing Center

Part of your exams requires that a submit written report that correctly uses statistical tools **and** follows good writing practices. If you want help or feedback with your writing (hint: you do) you are encouraged to reach out to the University Writing Center (UWC). UWC can help you with any part in writing process (e.g., brainstorming, drafting, documenting, revising, proofreading, and more). I *highly recommended* you schedule a meeting with them at least once this semester. For more information visit `https://writingcenter.tamu.edu/`.

Disability statement

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit `http://disability.tamu.edu`. Disabilities may include, but are not limited, to attention, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

If you are experiencing difficulties with your approved accommodations, contact the office responsible for approving your accommodations or the

Texas A&M ADA Coordinator Julie Kuder at ADA.Coordinator@tamu.edu or (979) 458-8407.

Pregnancy Accommodations

Texas A&M provides reasonable accommodations to students due to pregnancy and/or related conditions, such as childbirth, recovery, and lactation. Students should contact the University's Pregnancy Coordinator (https://titleix.tamu.edu/title-ix-and-pregnancy-students/) as soon as they become aware of the need for accommodation. Depending on the circumstances, accommodations could include extended time to complete assignments or exams, changes in course sequence, or modifications to the physical classroom environment.

Texas A&M will also allow a voluntary leave of absence, ensure the availability of lactation space, and maintain grievance procedures to provide for the prompt and equitable resolution of complaints of sex discrimination. For information regarding pregnancy accommodations, email: TIX.Pregnancy@tamu.edu.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit discrimination and harassment based on an individual's race, color, sex, (including pregnancy and related conditions), religion, national origin, age, disability, genetic information, veteran status, or any other legally protected characteristic. This includes forms of sex-based violence, such as sexual assault, sexual harassment, sexual exploitation, dating/domestic violence, and stalking.

Students should be aware that all university employees (except medical or mental health providers) are mandatory reporters, which means that if they observe, experience or become aware of an incident that they reasonably believe to be discrimination/harassment alleged to have been committed by or against a person who was a student or employee at the time of the incident, the employee must report the incident to the university.

Students can report discrimination/harassment, access supportive resources, or learn more about their options for resolving complaints on the University's Civil Rights & Title IX webpage (https://titleix.tamu.edu/).

Students should be aware that all university employees (except medical or mental health providers) are mandatory reporters, which means that if they observe, experience or become aware of an incident that they reasonably believe to be discrimination/harassment alleged to have been committed by or against a person who was a student or employee at the time of the incident, the employee must report the incident to the university.

Statement on the Family Educational Rights and Privacy Act (FERPA)

FERPA is a federal law designed to protect the privacy of educational records by limiting access to these records, to establish the right of students to inspect and review their educational records, and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings.

Currently enrolled students wishing to withhold any or all directory information items can do so within `howdy.tamu.edu` using the Directory Information Witholding Form. The complete FERPA Notice to Students and the student records policy is available on the Office of the Registrar webpage (`http://registrar.tamu.edu/Catalogs%2C-Policies-Procedures/FERPA/FERPA-Notice-to-Students#0-StatementofRights`).

Items that can never be identified as public information are a student's social security number, citizenship, gender, grades, GPR, or class schedule. All efforts will be made in this class to protect your privacy and to ensure confidential treatment of information associated with or generated by your participation in the class.

Directory items include name, UIN, local address, permanent address, email address, local telephone number, permanent telephone number, dates of attendance, program of study (college, major, campus), classification, previous institutions attended, degrees, honors and awards received, participation in officially recognized activities and sports, medical residence location, and medical residence specialization.

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors influencing a student's academic success and overall well-being. Students are encouraged to engage in healthy self-care practices by utilizing the resources and services available through University Health Ser-

vices (https://uhs.tamu.edu/). The TELUS Health Student Support app (https://uhs.tamu.edu/mental-health/student-support.html) provides access to professional counseling in multiple languages anytime, anywhere by phone or chat, and the 988 Suicide & Crisis Lifeline offers 24-hour emergency support at 988 or 988lifeline.org.

Students needing a listening ear can contact University Health Services at 979.458.4584. Call 911 or visit your nearest emergency room if you are currently experiencing a life-threatening situation or if your safety is at risk. 24-hour emergency help is also available through the 988 Suicide & Crisis Lifeline (988) or at 988lifeline.org.

On respect, Non-discrimination, Free Speech and Civil Discourse

Respect is a core value. The university website describes the importance of respect as follows:

> We appreciate, learn from and create a welcoming and inclusive environment that values uniqueness, diversity and a sense of community.[1]

This means that I expect everyone to engage with me, each other, and the course material in good faith regardless of any individual's race, ethnicity, religion, age, sex, gender, sexual orientation, class, disability, and nationality.

Texas A&M University is committed to providing safe and non-discriminatory learning, living, and work environments for all members of the University community. The University provides equal opportunity to all employees, students, applicants for employment or admission, and the public, regardless of race, color, sex (including pregnancy and related conditions), religion, national origin, age, disability, genetic information, or veteran status.

Texas A&M University will promptly, thoroughly, and fairly investigate and resolve all complaints of discrimination, harassment (including sexual harassment), complicity, and related retaliation based on a protected class in accordance with System Regulation 08.01.01, University Rule 08.01.01.M1, Standard Administrative Procedure (SAP) 08.01.01.M1.01, and applicable federal and state laws. In accordance with Title IX and its implementing regulations, Texas A&M does not discriminate on the basis of sex in any educational program or activity, including admissions and employment.

[1] https://www.tamu.edu/about/purpose-values.html

The following person has been designated to handle inquiries and complaints regarding the non-discrimination policies: Jennifer M. Smith, TAMU Associate VP & Title IX Coordinator at YMCA Ste 108, College Station, TX 77843, 979-458-8407, or email civilrights@tamu.edu. For other reporting options, visit the U.S. Department of Education Office for Civil Rights Complaint Assessment System (`https://ocrcas.ed.gov/contact-ocr`) to locate the address and phone number of the office that serves your area, or call 1-800-421-3481.

Texas A&M recognizes that the pursuit of truth through open and robust discourse is critical to academic inquiry. However, as a community of scholars, the university has an aspirational expectation that such discourse will be conducted in accordance with Aggie Core Values. In this "marketplace of ideas," we encourage civil dialogue creating an environment that allows individuals to express their ideas and to have their ideas challenged in respectful and responsible ways. Students can learn more about Freedom of Expression and Free Speech on the University's website about the First Amendment (`https://firstamendment.tamu.edu/`).

Course Schedule

Individual topics/dates may change based progress and understanding.

12 January: NO CLASS
13 January: Course Introduction and Syllabus Review

Unit 1: Review of statistical theory and concepts. Intro to R

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15 January: Probability Review
19 January: MLK Day. NO CLASS
20 January: Random variables

- Llaudet and Imai, Chapter 6, sections 6.1–6.4.1

22 January: The normal distribution

- Llaudet and Imai, Chapter 6, sections 6.4.2–6.4.4
- Problem set 1 assigned

26 January: LAB DAY

- Llaudet and Imai. Chapter 1
- Crisman-Cox, Ch. 1 (Skip sections 1.6–1.9)
- Kenkel, Ch. 1-2 (Skip section 2.2)

27 January: Data

- Llaudet and Imai, Chapter 3, sections 3.1–3.5.1
- Kenkel Ch. 3-4
- Crisman-Cox Ch. 2

29 January: Estimation

- Llaudet and Imai, Chapter 7, sections 7.1–7.2.1

2 February: LAB DAY 3 February: Hypothesis testing I

- Llaudet and Imai, Chapter 7, sections 7.3–7.3.1

5 February: Estimating causal effects

- Llaudet and Imai,Chapter 2
- Problem set 1 due
- Problem set 2 assigned

9 February: LAB DAY
10-12 February: Hypothesis testing II

- Llaudet and Imai, Chapter 7, sections 7.4

16 February: LAB DAY
17 February: Technical writing, presenting results, and making an argument

- `https://jgscott.github.io/teaching/writeups/write_ups/`
- `https://purdueglobalwriting.center/writing-a-persuasive-essay/`
- `https://writingcenter.unc.edu/tips-and-tools/scientific-reports/`
- `https://writingcenter.unc.edu/tips-and-tools/argument/`

Unit 2: The simple linear model

19 February: Covariance and correlation

- Llaudet and Imai, Chapter 3, section 3.5.2
- Problem Set 2 Due
- Exam 1 assigned

24 February: The Linear Model part 1

- Llaudet and Imai, Chapter 4, section 4.1–4.3

26 February: Properties of the OLS estimator

- Exam 1 technical component due, Part 2 assigned

1 March: LAB DAY
3 March: Model fit and prediction

- Llaudet and Imai, Chapter 4, section 4.4–4.6

5 March: Outliers

- Problem set 3 assigned

9-13 March: Spring Break–Wooo hooo! (No Class)

Unit 3: Linear model with multiple covariates

16 March: LAB DAY
17 March: Multiple regression, introduction and motivation

- Llaudet and Imai, Chapter 5, section 5.1–5.2

19 March: Writing day (NO CLASS, EXTRA OFFICE HOURS)

- Exam 1 report due
- Problem set 3 due

- Problem set 4 assigned

23 March: LAB DAY
24 March: Choosing control variables from a bias perspective

- Llaudet and Imai, Chapter 5, section 5.3–5.4

26 March: Choosing control variables from a variance perspective
30 March: LAB DAY
31 March: Dummy variables
2 April: Multiple hypothesis testing

- Problem set 4 due
- Exam 2 assigned

6 April: LAB DAY
7 April: Multiple hypothesis testing, continued
9 April: Heterogeneous treatement effects

- Technical portion of exam 2 due, part 2 assigned
- Problem set 5 assigned

13 April: LAB DAY

Unit 4: Advanced topics

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14 April: Logged variables

- Last day for Q-drop, withdrawal

16 April: Continuous interactions
20 April: LAB DAY
21 April: Polynomial regression

- Problem set 5 due

23 April: Writing day (NO CLASS, EXTRA OFFICE HOURS)
27 April: LAB DAY
28 April: (Redefined Friday, NO CLASS)
30 April: Final exam period begins

- Final draft of exam 2 is due by 2:30pm on April 30th (subject to change if the Registrar changes our final exam day/time).

Final Disclaimer

The schedule, policies, procedures, assignments, and topics discussed in this course are subject to change in the event of extenuating circumstances and/or to provide for better student learning. These changes are entirely at the discretion of the instructor and may include discussions that may seem outside the scope of this course or syllabus; they are not. This syllabus provides an overview of topics that we may discuss, time permitting, but the instructor and teaching assistants do not preemptively agree to limit themselves to just what is listed here or that the topics will match the listed dates exactly.