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**POLS 309W-902: Polimetrics**

Spring 2018  
Texas A&M University  
3 credits

**Class time:** MWF 2:25-3:15pm  
**Class location:** Allen 1003  
**Course website:** Google drive

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**Professor:** Dr. Erica Owen  
**Office hours:** Monday 1:15-2:15pm, or by appt.  
**Office:** 2102 Allen Building  
**Email:** ericaowen@tamu.edu  
**Phone:** (979) 845-5623

**Teaching assistant:** Kostanca Dhima  
**Office hours:** Office hours: Thursday 1:30-3:30pm  
**Office:** Allen 2105  
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### Course Description and Objectives:

*This is first and foremost a demanding statistics course.* This course is an advanced undergraduate course in statistical methods for political research. It covers statistical theory, techniques, and applications of quantitative analysis in political science. POLS 209 is a prerequisite. This is also a writing intensive course.

The math and programming required by this course will be challenging for most students. As such, students should be prepared to attend *every* class and devote time outside of the class to learning this material on their own. If you are taking this class, you *must* be prepared to spend extra time outside of class learning course material, on your own and in study groups, and completing weekly homework assignments.

The course consists of roughly three parts, with an emphasis on the first two. The first part covers learning to use the software program R (see below), the logic of statistical inference, hypothesis testing, and basic statistics to describe bivariate relationships. The second part demonstrates how to evaluate hypothesized relationships through bi- and multivariate regression. Finally, the third part focuses on a final research project and introduces more advanced topics.

A good understanding of statistical methods in this course requires that (a) the student is able to represent a statistical idea correctly using algebraic notation and numeric values and (b) the student must be able to explain in words correctly the statistical idea that is represented by notation. These two skills are complementary and fundamental to appropriate applications of quantitative methods. By the end of the semester, you should be able to:

- define foundational statistical theories, concepts, and methods commonly used in political research and use to interpret and evaluate quantitative studies in political science journals;
- program in R to finish computer homework assignments and the research project, acquiring proficiency in data management and statistical analysis;

- complete a technical research paper based on the replication of a previously published statistical analysis, which demonstrates both statistical and writing skills.

### **Why take 309?**

Given the demanding nature of the course, it is important that students understand the benefits of taking 309 and thus, the potential payoff of their hard work. Other than being a required course for the BS track, 309 has been extremely helpful and valuable in many different ways for those who survived it. Numerous students used their data analysis skills, knowledge, and research reports from 309 to significantly improve their chances of success in applying for various masters and doctoral programs (e.g., public policy, education, political science, international affairs, environmental studies, sociology), law schools, and public and private sector data analyst jobs (e.g., high-school teacher in AP statistics, Toyota, Houston Rockets, Astro, VISA, the Rangers).

In Fall 2017, we conducted a survey in two sections of 309 students. Here are some findings from that survey: Among 25-30 graduating seniors, 57% indicated that they would use the skills acquired in 309 after graduation, 52% said that they looked for jobs because of skills acquired in 309, and 62.5% listed 309 skills on their resumes. Among 24 students that applied for jobs, 33% said that they applied for data analyst jobs because of 309. Among 21 responses from students that applied for jobs, 33.3% agreed 309 helped them get an interview. Among the 14 students who got job offers, nearly a quarter of students surveyed (21%) believed that 309 helped them get a job offer (as data analysts and market researchers).

### **Who should not take 309?**

This is a demanding technical course. You will be unpleasantly surprised if the following apply to you:

- You desperately need a writing intensive course to graduate and this is the only one that has an open spot.
- You like to skip class lectures for one reason or another (attendance policy detailed below will rule out this possibility).
- You like to check your phone and surf internet regularly during lectures that you find difficult to understand and relate to (once you start going down that path, you might soon reach a point of no return).
- You are graduating this semester, have to travel a lot for job interviews, and will miss a lot of lectures (well, you may fail this course and fail to graduate as a result).
- You have trouble with finishing coursework. Unfortunately, this is a course of heavy workload; passing the course is simply not possible if you skip some of the following: lectures, lab sessions, homework assignments, exams, term project.

### **Who will (not) do well in this course?**

It is easy to predict who will do well in this course. It has always been those who never miss class, who ask questions whenever confused, who follow instructions closely and complete all homework assignments, who form or join study groups for assignments and exams, who follow instructions to preview and review course materials, and who ask various nagging questions about the materials in class and in office hours.

In contrast, if you miss several lectures, always start homework assignments the night before they are due, never seem to understand and follow the assignment instructions, always study and do homework alone, never read the textbook, and study the materials only right before the exams, your grades will be predictably low based on past experiences.

## Grading

- Homework (30%). Between 5 and 8 problem sets. All work is expected to be typed and written in complete sentences unless otherwise noted on the assignment.
- Two exams (20% each). Two in-class exams cover the first two parts of the course. Exam 1 focuses on basic statistical concepts, while Exam 2 covers advanced statistical concepts. Content of exams is based on textbooks, course lectures and problem sets.
- Research project (30%). The project requires students to replicate the data analysis in a published political science journal article, conduct extensive robustness checks, and submit draft output and code, in addition to the final research project. The final paper should be at least 10 pages in length, following the style of published journal articles. The replication journal article **MUST** be chosen in consultation with the instructor. A rough draft will be due prior to submission. Additional guidelines will be provided by the instructor.
- Attendance and extra assignment (bonus credit). See policy below.
- Unexcused absence (-10% for each unexcused absence). See policy below.

The following grading scale (%) will be used to assign final grades:

$A$	$=$	$\geq 89.5$
$B$	$=$	$\geq 79.5 - < 89.5$
$C$	$=$	$\geq 69.5 - < 79.5$
$D$	$=$	$\geq 59.5 - < 69.49$
$F$	$=$	$< 59.5$

## Course Expectations and Policies

**Participation and Attendance:** Attendance will be taken daily. Regular class attendance is critical to success in this course. I will not give out copies of my notes. As such, it is your responsibility to obtain the notes and announcements from colleagues if you are absent during the class.

**Based on previous 309 classes, it is clear that class attendance is highly correlated with whether students pass the course or not. Hence, two class attendance policies are enacted: (A: carrot) Students who attend class lectures regularly will get extra credit at the discretion of the instructor (based on the number of attendances). (B: stick) Each student is allowed one unexcused absence; beyond that, each unexcused absence will result in a one-letter-grade deduction from the final course grade.**

**All excused absences must be documented (<http://student-rules.tamu.edu/rule07>). Barring unexpected emergencies, it is the students responsibility to obtain approval from the instructor for any excused absence **BEFORE** rather than **AFTER** class. The stringent attendance policy has many reasons.** For example, a student who failed in a previous 309 class and is now retaking it skips lectures and homework in the beginning weeks; some other times,

a student who did really well in 209 and felt comfortable with basic statistics skips the beginning weeks. Such behavior often leads to big problems in the course because different professors often teach same materials in somewhat different manners, with different notations and different expectations. Regardless of how well or poorly you did in a previous course, skipping lectures typically leads to regrettable outcomes. Finally, in a significant number of cases, students just do not feel like coming to class. When this happens, these students often fail to keep up with course materials; the stringent attendance policy is meant to help them to maintain attendance and minimize the probability of their failing the course.

**Late policy:** Homework assignments are due at the beginning of class on the due date. A weekly homework assignment turned in the class period after it is due will be given a one letter grade deduction; those beyond one class period of the due date will not be accepted.<sup>1</sup> I encourage you to start assignments early in the event that you need assistance. Skipping homework assignments is a very, very bad idea for they prepare you for and are far easier than either the exams or the term project.

*Late assignments pertaining to the research project (including the final draft) will not be accepted, except in the case of a university-approved absence.*

**Teaching assistant:** We are fortunate to have a TA for this course. The TA will be responsible for grading all assessments, as well as running Friday lab sessions. Students are strongly encouraged to take advantage of the TA's office hours as an additional resource for help learning course material.

**Slides and note-taking:** I will post slides the day before class. Students are strongly encouraged to bring **HARD COPIES** of the slides to class for note-taking. Often we will work through examples on the board, and it is much much easy to take such notes by hand. Slides are a framework for lecture and may contain formulas or statistical output, but they are **NOT** stand alone notes or substitutes for class attendance.

**W course:** This is a writing-intensive course. This means that in order to pass, students must submit written work that not only addresses the substance of the assignment, but also meets the instructor's expectations for writing (properly organized, grammatically correct, etc.). This applies to homework assignments as well as the research project.

**Exam absences:** Make-up exams will be permitted only in the case of university-excused absences, in other words, only if the student presents original written documentation of legitimate circumstances that prevented the student from taking the exam on time. Except in the case of the observance of a religious holiday, to be excused, the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g. accident, or emergency) the student must provide notification by the end of the second working day after the absence. This notification should include an explanation of why notice could not be sent prior to the class. Accommodations sought for absences due to the observance of a religious holiday can be sought either prior or after the absence, but not later than two working days after the absence. Legitimate circumstances include religious holidays, illness (verified by a doctor), serious family emergencies and participation in group activities sponsored by the University, etc. See <http://student-rules.tamu.edu/rule07> for additional information. Please note that I do not accept Xeroxed copies of medical excuses from students. *Unexcused absences from either exam will result in a score of 0 for the exam.*

**Grade appeals:** Please direct all grade appeals to me the instructor. You have one week after you receive your graded work to request a re-grade from the instructor. You must include a written statement

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<sup>1</sup>This means that an assignment due Monday must be turned in by Wednesday of the same week in order to receive credit, minus the late penalty. An assignment due Friday must be turned in by Monday of the following week in order to receive credit, minus the late penalty.

detailing why you believe your work should be re-graded and which part(s) I should focus on. Upon re-grading, I may raise, lower or maintain your original grade. One exception to this policy is if there is an arithmetic mistake, which will be corrected without a written statement.

**Contacting me:** Outside of my office hours, the best way to reach me is via email at [ericaowen@tamu.edu](mailto:ericaowen@tamu.edu). As with all business related correspondence, please include an appropriate salutation, identify yourself, and write in complete sentences.

I am happy to answer brief clarification questions via email, but questions about course material, grades, or research projects 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/work schedule, or another important commitment, please do not hesitate to contact me for an appointment. Please make sure and e-mail me early if you have a time-specific question (e.g. about an exam or assignment). Please follow these guidelines when contacting the course TA also.

### **Required texts:**

Dougherty, Christopher. 2016. *Introduction to Econometrics*. 5th edition. Oxford University Press. (Please see the website for slides, study guides and other materials <http://www.oup.com/uk/orc/bin/9780199567089/>)

Li, Quan. 2017. *Using R for Data Analysis in Social Sciences: A Research Project-Oriented Approach*. Oxford University Press. Manuscript provided on course website. Do not circulate!

All other course materials, assignments, and data will be uploaded on the course website. Students are expected to check the website regularly.

### **Software:**

In this class we will use the computer program R to conduct data analysis. R is a freely available statistical software that is available for download onto your personal computer at <http://cran.r-project.org/>. R is much more powerful than other statistical software such as SPSS, STATA and SAS, but the R programming language is also more challenging to learn.

We will use it because it is (a) free, (b) flexible enough to test most theories of political science, and (c) widely popular in both the public and private sectors. Friday class sessions will generally be held in the computer lab and will be dedicated to learning to use R effectively.

**Course Materials Copyright:** The handouts used in this course are copyrighted. By “handouts,” I mean all materials generated for this class, which include by are not limited to syllabi, slides tests, and assignments. Because these items are copyrighted, you do not have the right to copy handouts, unless I expressly grant permission.

## Course Schedule

Please note that all dates are subject to change at the discretion of the instructor, with sufficient advance notice provided to students. I will announce changes in class. *Fridays will be lab days, held in Allen 2068.*

### Part I: Learning R, Basic Statistics\*

\* Dougherty review sections as reference

1/17, 1/19, 1/22	Course intro, descriptive statistics, Learn R.	Lecture; Li introduction, Ch 1.
1/24, 1/26, 1/29, 1/31	Logic of inference	Lecture, Li Ch 2, Ch 3
2/2, 2/5, 2/7	Inference for two variables	Lecture, Li Ch 4
2/9	Difference of means test	Lecture, Li Ch 3
2/12	Review	
2/14	EXAM 1	
2/16	Catch up in lab	

### Part II: Regression analysis

2/19, 2/21, 2/23	Simple regression (OLS, estimation, inference) ARTICLE SELECTION DUE 2/23	D Ch 1, Li Ch 5
2/26, 2/28, 3/2	Properties OLS	D Ch 2-3, Li Ch 5
3/5, 3/7, 3/9	Multiple regression	D Ch 3, Li Ch 5
3/12-3/16	Spring break	
3/19, 3/21, 3/22	Dummy variables	D Ch 5
3/26, 3/28	Model specification	D Ch 6, Li Ch 6
3/30	Reading day (no class)	
4/2, 4/4, 4/6	Heteroskedasticity, serial correlation	Ch 7, Li Ch 6
4/9	Review	
4/11	EXAM 2	

### Part III: Advanced topics and research project

4/16	Diagnostics (outliers, collinearity)	Li Ch 6
4/18, 4/20	Interactive model	Ch 4
4/23, 4/25, 4/27	In class lab sessions ROUGH DRAFT DUE BEGINNING CLASS 4/27	
4/30	Rough draft returned, revisions in lab	
5/4	REPLICATION PAPER DUE BY 2:00PM IN INSTRUCTOR’S MAILBOX	

*Note:* There will be no final exam in this class.

**University Writing Center (UWC)**, located in 214 Evans Library and 205 West Campus Library, offers one-on-one consultations to writers. UWC consultations are highly recommended but are not required. Help is available with brainstorming, researching, drafting, documenting, revising, and more; no concern is too large or too small. UWC consultants will also help you improve your proofreading and editing skills. If you visit the UWC, take a copy of your writing assignment, a hard copy of your draft or any notes you may have, as well as any material you need help with. To find out more about UWC services or to schedule an appointment, call 458-1455, visit the web page at [writingcenter.tamu.edu](http://writingcenter.tamu.edu), or stop by in person.

**Accommodations for Students with Disabilities:** All discussions will remain confidential. University policy is in accordance with the Americans with Disabilities Act Policy Statement.

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek Complex on West Campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>.

Reasonable accommodations will be made for all students with disabilities, but it is the student's responsibility to inform the instructor early in the term. Do not wait until just before an exam to decide you want to inform the instructor of a learning disability; any accommodations for disabilities must be arranged well in advance.

### **Academic Integrity Statement and Policy**

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

The instructor, the Department of Political Science, the College of the Liberal Arts and the University, take violations of academic dishonesty seriously. Observing basic honesty in one's work, words, ideas, and actions is a principle to which all members of the community are required to subscribe. All course work by students is to be done on an individual basis unless an instructor clearly states that an alternative is acceptable. **Any reference materials used in the preparation of any assignment must be explicitly cited.** Please ask the instructor or writing center if you have questions!

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with the definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of the person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the Aggie Honor System Office website (<http://www.tamu.edu/aggiehonor>) or the latest version of the Texas A&M University Student Rules, under the section “Scholastic Dishonesty.”

**Diversity policy.** The Department of Political Science supports the Texas A&M University commitment to diversity, and welcomes individuals from any racial, ethnic, religious, age, gender, sexual

orientation, class, disability, and nationality. (See <http://diversity.tamu.edu/>). In the spirit of this vital commitment, in this course each voice in the classroom has something of value to contribute to all discussions. Everyone is expected to respect the different experiences, beliefs and values expressed by fellow students and the instructor, and will engage in reasoned discussion that refrains from derogatory comments about other people, cultures, groups, or viewpoints.