

**POLI 7962:
Seminar in Quantitative Analysis
Fall 2020
Tuesday 4:30 – 7:20
Coates 212**

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Torture numbers, and they'll confess to anything.

--Anonymous cynic

*And if California slides into the ocean, like the mystics and statistics say it will,
I predict this hotel will be standing, until I pay my bill.*

--Warren Zevon, from "Desperadoes Under the Eaves"

Introduction

The purpose of this course is to introduce students to a range of basic statistical and data analytic techniques necessary to understand and conduct quantitative political, social, and policy research. The development of such methodological skills is an absolute necessity for social scientists. Professional social scientists are often called upon either to conduct quantitative research on their own or, at the very least, to be able to understand, interpret, and utilize the considerable body of social research that employs quantitative analytical techniques. Courses in statistics subsequently should not be viewed as an obscure degree requirement for the M.A. or Ph.D. programs in social science disciplines, but should instead be seen as providing an introduction to the requisite research skills for practicing social scientists.

While the topics covered in this seminar cannot in any way be considered exhaustive, they do represent many of the basic statistical issues with which social scientists should be familiar. Several topics will be examined in this course. First, we will discuss briefly the philosophy of social science and the role of quantitative methods in conducting research in the social sciences. Second, we will discuss various statistical techniques utilized in univariate analysis--i.e., measures of central tendency and dispersion. Third, the logic of statistical inference and hypothesis testing will be examined. Of primary interest in this section will be the estimation of population parameters (characteristics) based on information collected from random samples drawn from populations. These techniques are the building blocks for more sophisticated statistical analyses. Finally, we will discuss various bivariate and multivariate statistical techniques. Because social science often focuses upon the relationship between two (or more) variables, special emphasis will be placed on establishing the magnitude and direction of such relationships as they exist within both populations and samples of populations.

Two major points should be made about this course. First, one of the best ways to learn about statistical techniques is to practice them as much as possible. Hence, on most class days we will work several problems that require the use of the various statistical techniques examined in this course. By going through the process of computing the answers to statistical problems, it is hoped that each student will develop the statistical skills necessary to understand and conduct empirical research.

Second, one major goal is to help students identify and discard numerous myths about statistical analysis. To take one example, many students in the social sciences adhere to the view that it is easy "to lie with statistics." While there is a speck of truth to this proposition, for the most part lying with statistics is a more successful strategy when one lies to individuals who do not understand statistical methods. (I would revise this "truism" to state that it is easy to lie with statistics to those who don't understand statistics!) Social scientists who are well-trained in statistical methods can usually differentiate good statistical arguments from bad ones. One goal of this course is to give social science students (and others) the skills necessary to analyze statistical arguments and the validity of inferences drawn from statistical statements.

Course Requirements and Evaluation

Each student will be evaluated on the basis of the following:

Midterm Examination	100
Final Examination	100
Total Points	200

1. *Midterm Examination.* A comprehensive midterm examination covering all material from the first half of the course will be required for all students. Information pertaining to the format of the midterm examination will be provided to all students prior to the exam.
2. *Final Examination.* A comprehensive final examination covering all material from the second half of the course will be required for all students. Information pertaining to the format of the final examination will be provided to all students prior to the exam.

The grading scale for the course is as follows:

A+	97.5% - 100%
A	92.5% - 97.5%
A-	89.5% - 92.5%
B+	87.5% - 89.5%
B	82.5% - 87.5%
B-	79.5% - 82.5%
C+	77.5% - 89.5%
C	72.5% - 77.5%
C-	69.5% - 72.5%
D+	67.5% - 69.5%
D	62.5% - 67.5%
D-	59.5% - 62.5%
F	Below 59.5%

Required Reading

There is no required text for this course. There may be some recommended reading during the course. In addition, I will provide a full set of class notes and course assignments. Course readings, class notes, course assignments, and other materials will be made available through Moodle and/or by email.

Computer Statistics Package

There are numerous statistics programs that can be used to conduct statistical analysis with a mainframe or personal computer. In this course we will use Stata 16.0, a commonly-used (and easy-to-use) statistics program. I should also note that if you have a copy of Stata 13.0, Stata 14.0, or Stata 15.0 that will work for most of what we are going to do.

If you are serious about doing quantitative research, I would encourage you to purchase a copy of Stata. Other programs (such as SPSS or SAS) are fine, but Stata is easy to learn and use, and I find that it is much more powerful and flexible for most applications than other programs. This is particularly the case for categorical data analysis, which will be the focus of this class. Stata will be the only program supported during this class, and computer assignments will be conducted using Stata.

Stata is expensive, but fortunately the Stata Corporation provides educational discounts. Stata can be purchased at the following web site:

<https://www.stata.com/order/new/edu/gradplans/student-pricing/>

Notice that there are multiple options. First, at the very least you should purchase Intercooled Stata 16.0 with a one-year license (\$94); this will give you access to Stata on your personal computer on a temporary basis, though there are some limits on the size of data sets that can be used with this version of Stata. Second, a mid-range (and recommended) option is Intercooled Stata 16.0 with a perpetual license (\$225). Finally, if you (1) will be doing a lot of statistical analysis in your research in the future, particularly with larger data sets, and (2) can at all possibly afford it, I encourage you to purchase Stata / SE 16.0, which is the most powerful version of Stata but is somewhat pricey (\$425). Do not purchase the Small Stata 16.0, which is really for very small data sets and will not accommodate some of the data sets that we will use this semester.

Stata Resources

Because some of you have not had experience with Stata, there are several Stata resources that I recommend. First, I will make available to you a .pdf introduction to Stata:

Scott L. Minkoff, *An Introductory Guide to Stata*

Even though this manual is designed for Stata 11.0 rather than Stata 16.0, the differences in the two versions are sufficiently small that Minkoff's manual will be very helpful to you.

There is also a lengthy (but informative) introduction to Stata that is a Powerpoint presentation converted to a .pdf format:

Christopher Baum, *Introduction to Stata*

In addition, I would like to direct you to the following web sites that are designed to assist Stata users. These are very useful web sites that provide detailed information about Stata commands. You should bookmark these web sites and refer to them often.

The first is a broad-based Stata web site, the *Institute for Digital Research and Education (IDRE)*, housed at UCLA. One can find a wide range of information about Stata on this web site. I would encourage you to take a look at the links on this web site and familiarize yourself with what this site has to offer:

<https://stats.idre.ucla.edu/stata/>

Here is another UCLA site that has basic "learning modules" for Stata procedures.

<https://stats.idre.ucla.edu/stata/modules/>

Here is a web page at Princeton that provides a basic introduction to Stata:

<http://data.princeton.edu/stata/>

Finally, this is a Princeton web site that has a series of downloadable chapters about how to estimate a variety of models in Stata, including simple OLS regression models, which we will discuss this semester.

<http://data.princeton.edu/wws509/stata/>

Graduate Assistant:

The graduate assistant for this course is:

Moriah Harmon
326 Stubbs Hall
Email: mharma4@lsu.edu

Office Hours

Garand: Hours by appointment

Harman: Friday 1:00 – 4:00
Other hours by appointment

Course Moodle Page

I have created a Moodle page for this course. The site will include assignments, data sets, links to statistics web sites, and other helpful information. The course Moodle web site can be found by logging on to your PAWS account.

Note that I will post all class notes on the course Moodle page.

Calculator

Many of the statistical problems to be worked out during the semester require the use of a calculator with a square root function. Each student is strongly encouraged to purchase such a calculator or otherwise to have one available.

Academic Misconduct Statement

Academic misconduct is defined by the Code of Student Conduct. You are encouraged to familiarize yourself with the LSU policy on academic misconduct, particularly regarding plagiarism. The LSU Code of Student Conduct can be found on the web site for the LSU Dean of Students:

<https://www.lsu.edu/saa/students/codeofconduct.php>

Please read the section labelled “10.0 Misconduct.” Academic misconduct is a serious violation of university policy, but more importantly it is a significant scholarly violation for political scientists. Plagiarism and other forms of academic misconduct will not be tolerated in this course. Charges of academic misconduct will be turned over to the Dean of Students for appropriate disciplinary action.

I am serious about this.

Class protocols relating to Covid-19 Pandemic

LSU is taking the Covid-19 pandemic seriously, and so the university has implemented a number of protocols relating to holding classes during the pandemic. In addition, I want more than anything for all of us to get through the semester without any serious illness, particularly illness related to Covid-19. Given this, permit me to review how this class will proceed.

1. The current plan is for this class to be held on an in-person basis, with appropriate social distancing, required mask usage, and disinfecting classroom spaces. The latest count is that there are 34 students enrolled in the class, to be held in a classroom that normally seats 77 students. There is about 15-20 feet between the whiteboard and the first row of seats, along with a plexiglass screen in front of the podium. There is room for students to spread out in the class and remain physically apart from me and fellow classmates.
2. I am very sensitive to students' concerns about their health and safety. My plan is to accommodate students who feel uncomfortable in coming to class by (1) live streaming the class on Zoom, and (2) recording the lectures (with captioning). This will help students who do not feel comfortable coming to class as well as those students who (heaven forbid) might become ill over the course of the semester.

I am trying to work out the logistics of presenting an in-person lecture, streaming it live with two cameras (one for me, one for the whiteboard), and recording the lecture with two cameras. There will, no doubt, be some kinks to work out. But I also want students to be healthy and safe, so I am willing to accommodate as best I can those who would prefer to stay home or who are unable to attend class in person. I will also make my lecture notes and other materials available to students to follow along.

3. We need to prepare for the possibility that LSU will suffer a pandemic among students, faculty, and staff and that as a result LSU will move to a completely online format at some point. If that happens we will move to delivery of course material online with synchronous lectures and recorded lectures.
4. For in-person class meetings, *all students are required to wear a mask at all times while in the classroom*. LSU is requiring masks, and I understand that it is violation of the LSU Code of Student Conduct not to wear a mask in class. I take this mask requirement very seriously, and it will be strictly enforced during class meetings.

I also strongly encourage all students to spread out to maintain social distancing.

It is also my understanding that disinfectant and other cleaning supplies will be made available in all classrooms. Students are strongly encouraged to wipe down and disinfect their desks both before and after they are finished using them.

5. All exams will be take-home exams. These exams will be sent to students via email, and completed exams will be returned electronically via email.
6. *If you are showing any of the standard symptoms for Covid-19, please do not attend the class in-person*. I would strongly encourage you to be tested as soon as possible.

Course Outline

August	25	Introduction: The Role of Statistics in Political and Social Research Variables, Data, and Measurement
September	1	Introduction to Stata
September	8	Univariate Analysis: Frequency Distributions
September	15	Univariate Analysis: Central Tendency and Dispersion
September	22	Univariate Analysis: Central Tendency and Dispersion
September	29	Sample Estimation of Population Parameters
October	6	Sample Estimation of Population Parameters (continued)
October	13	Sample Estimation of Population Parameters (continued) Midterm Examination
October	20	Bivariate Analysis: Difference in Two Means
October	27	Bivariate Analysis: Analysis of Variance (ANOVA)
November	3	Bivariate Analysis: OLS Regression
November	10	Bivariate Analysis: OLS Regression (continued)
November	17	Bivariate Analysis: OLS Regression (continued) Multivariate Analysis: Multiple Regression
November	24	Thanksgiving week (No class meeting)
December	1	Multivariate Analysis: Multiple Regression (continued)
December	7-12	Final Examination week

About the Instructor

James C. Garand (Ph.D., University of Kentucky, 1984) is the Emogene Pliner Distinguished Professor of Political Science at Louisiana State University.

Professor Garand has teaching and research interests in the fields of electoral politics, public opinion, legislative politics, public policy, state politics, racial and ethnic politics, domestic political economy, and research methodology and statistics. His research on a wide range of topics in American politics has been published in numerous journals, including the *American Political Science Review*, *American Journal of Political Science*, *Journal of Politics*, *British Journal of Political Science*, *Political Research Quarterly*, *Western Political Quarterly*, *Comparative Political Studies*, *Legislative Studies Quarterly*, *PS: Political Science and Politics*, *Political Behavior*, *American Politics Research*, *American Politics Quarterly*, *Public Choice*, *Social Science Quarterly*, *Electoral Studies*, and *Journal for the Scientific Study of Religion*, among others. His coedited book, *Before the Vote: Forecasting American National Elections*, was published by Sage Publications in 2000.

Professor Garand received the 2006 LSU Distinguished Research Master Award in recognition of outstanding faculty accomplishments in research and scholarship. In 2009 he was recognized as an LSU "Rainmaker," an award given by the LSU Office of Research and Economic Development (ORED) for national and international recognition "for innovative research and creative scholarship." He served as President of the Southern Political Science Association in 2004, and he is also former president of the State Politics Section of the American Political Science Association. He served as Vice-President and Program Chair in 2001 for the Southern Political Science Association. Professor Garand is former editor of the *American Politics Quarterly*, one of the leading subfield journals in American politics. He currently serves on the editorial boards of *American Politics Research*, *Journal of Political Marketing*, and *Ralph Bunche Journal of Public Affairs*, and he is a former member of the editorial boards of the *American Journal of Political Science*, *Journal of Politics*, *State Politics and Policy Quarterly*, *PS: Political Science and Politics*, and *Legislative Studies Quarterly*. He also serves as a member of the International Advisory Board of the *Online Portal for Social Science Education in Methodology* (OPOSSEM).

Professor Garand has received numerous faculty awards. In 1997 Professor Garand received the LSU Alumni Association Distinguished Faculty Award in recognition of sustained excellence in teaching, research, and service. In 2012 he received the Tiger Athletic Foundation Undergraduate Teaching Award recognizing excellence in teaching in the LSU Honors College. In 2001 he received the LSU Foundation Distinguished Faculty Award in recognition of his excellence in graduate teaching, and he is the 1990 recipient of the university-wide Student Government Association Teaching Excellence Award for undergraduate teaching. He is also a recipient of the Alpha Lambda Delta Freshman Honor Society certificate of recognition for superior instruction of freshman students during the Fall 2000 semester.

Professor Garand's doctoral students have had considerable success, earning faculty appointments at the University of Maryland, University of Alabama (2), University of Florida, Wake Forest University, University of Rhode Island, Appalachian State University, University of Houston, the Citadel, the University of Texas at Tyler, Kent State University, among others. Professor Garand has also mentored other students who have earned faculty and administrative appointments, including at Princeton University, University of Notre Dame, University of Georgia, University of Kansas, University of Michigan (post-doc), Southern Methodist University, and the University of Mississippi, among others. His most recent doctoral student, Angela McCarthy, was the 2020 recipient of the Josephine A. Roberts LSU Alumni Association Distinguished Dissertation Award in Arts, Humanities, and Social Sciences at LSU.