EPPS 2302.502: Methods of Quantitive Analysis in the Social and Policy Sciences

Instructor: Les Stanaland

Fall 2019

E-mail: `les.stanaland@utdallas.edu`
Office Hours: M 12-2:30pm; T 5-6:45pm
Office: GR 2.816

Classtime: MW 2:30 - 3:45pm
Classroom: GR 2.530

Course Description

This course introduces basic concepts and methods of statistical analysis used in different fields of social and policy science research to better understand human relationships and the impacts of government action on them. Topics include data description, using probability to assess the reasonableness of claims about the world based on sample data, exploring cause-effect interactions through regression models, and application of software to ease visualization and calculation. Students completing this course will be good consumers of statistical information and have a solid foundation for pursuing further study of quantitative analysis.

Prerequisites

Students enrolling in this course must satisfactorily pass MATH 1314 or its equivalent.

Required Materials

- We will use the following textbook: Michael Sullivan. *Statistics: Informed Decisions Using Data, 5th edition*. Pearson. ISBN: 9780134508306.
  - This book should be available at the campus bookstore, alternative retailers off campus, and through various e-retailers. Renting, pooling resources for common ownership, and older versions are other options to procure this text. Note: Chapter designations for older editions *may not* be the same.
- `Stata` access

  - A 6 month license for this program for students is $45. Visit http://www.stata.com/order/new/edu/gradplans/student-pricing for more info. Alternately, all EPPS lab computers have `Stata` installed for student use.

- `R` access
  - Free. Download `RStudio` at https://www.rstudio.com/products/rstudio/download/#download. `R` is also available on all EPPS computers.

- A basic scientific calculator. *No* programmable calculators allowed or necessary.

Student Learning Outcomes

This course aims to provide for you a strong foundational understanding of how statistics is done in the social sciences, which will allow you not only to understand published statistical results, but also compute your own research. By the end of the course, you should be able to:

1. Describe and utilize data.
2. Understand and apply probability and relevant concepts.
3. Create hypotheses and appropriately examine them.
4. Understand and apply regression techniques.
5. Gather a working understanding of popular statistical software.

Course Rules & Policies

Grading Policy

- Quizzes: 6 will be assigned; I will only record the 4 highest grades. These will be done in class and will not require statistical software. **20% of course grade**
- Problem Sets: 4 will be assigned; all 4 will be graded. These will be completed outside of class and will require statistical software. **20% of course grade**
- Lab exercises: This course is quite amenable to group work and problem solving in the classroom. I will collect at random as many of these exercises as I think is warranted. **10% of course grade**
- Midterm Exam: Wednesday, October 9th in class. **25% of course grade**
- Final Exam: Monday, December 9th from 2:00pm to 4:45pm in the Testing Center. **25% of course grade**
- Final grades will be assigned via the following scale:

A+: 97 - 100	A: 93 - 96	A-: 90 - 92	B+: 87 - 89	B: 83 - 86	B-: 80 - 82	
C+: 77 - 79	C: 73 - 76	C-: 70 - 72	D+: 67 - 69	D: 63 - 66	D-: 60 - 62	F: 0 - 59

Except in cases where there is a legitimate, documented reason (i.e. - medical emergency), there will be ***NO MAKEUP QUIZZES OR EXAMS***. The midterm will be open note, open book, but not open device.

Quizzes: Quizzes are meant to check your understanding of the material and ensure that you understand the fundamentals of how any given formula works. This process will also help you make sense of the statistical software output so you can better understand what is going on with your data.

Problem Sets: Problem sets will be distributed one week prior to their due date. These are intended to be good practice exercises as well as helpful for the final exam. These are to be typewritten and turned in **as a hard copy** at the beginning of class. Except in unusual circumstances, problem sets turned in late will be penalized 10% per day. The exception to this late work policy is for Problem Sets 2 and 4; since these are tied to exam reviews, they will not be accepted late at all for any reason.

Incompletes

Generally speaking, the material in this course is best learned as a single unit. I will grant incompletes only in cases where a substantial change in life circumstances occurs that is beyond the control of the student, and only with appropriate documentation. Furthermore, by university policy, an incomplete can only be granted when at least 70% of the coursework has been completed at a passing level.

Study Groups

I highly recommend study groups. You will already have a class group; however you can form groups with anyone in class. Many times the course material may be confusing, or notes unclear. Groups can help you fill in those missing gaps. One must be careful however, because all worked turned in ***must be your own***. *Do not turn in any one else's work, even a member of your group. That is plagiarism.* Also, I recommend not letting the one student in your group who "gets it" to do all the work. Don't place your grade in the hands of another. Lastly, beware of groupthink.

Makeup work

Makeup work will only be allowed in cases of documented emergency.

Comet Creed

"As a Comet, I pledge honesty, integrity, and service in all that I do."

Personal Policies

Communicating with me doesn't have to be a formal affair; however, it is also not like texting your friend about where to meet after class. This is a great time to learn professional communication strategies; one way to start is to use your UTD email address (or BlackBoard) for any communication with me. If you use your personal email address, I will not be able to reply because of federal privacy laws. Allow 24 hours for me to reply to all weekday emails; I do not

usually check emails over the weekend. Also, kindly put "EPPS 2302" in the subject line of any emails to me.

Lastly, I have a 24-hour "no discussing the exam results" policy. Upon receiving feedback on your exams, the grade you get may not be what you hoped, causing confusion and/or anger. Therefore, the 24-hour policy protects us from saying things in the heat of the moment which we may regret later. Many times, after waiting that day, a reassurance sets in that one bad grade is not the end of the world or the course, and life can proceed. After that 24-hour period, feel free to contact me for a regrade; however, the regrade may be the same, higher, or lower than the original grade.

Course Structure

Most classes will be a combination of lecture and class activity. Laptops are nice for these activities, but not required. If you have one, please bring to class. However, you must make sure you are on task. It is tempting to do other things; you will not be tested on anything in this class except statistics (hint hint).

University policies

The information contained in the following link constitutes the University's policies and procedures segment for the course syllabus. Please go to `http://go.utdallas.edu/syllabus-policies` for these policies.

Course Schedule

The schedule is tentative and subject to change at the discretion of the instructor.

Week 01, 08/19 - 08/23: Course Overview / `Stata & R` intro / Collecting Data

- Text: Sullivan ch. 1

Week 02, 08/26 - 08/30: Summarizing Data using Tables & Charts

- Text: Sullivan ch. 2

Week 03, 09/02 - 09/06: Numerically Summarizing Data

- Text: Sullivan ch. 3
- Monday - Labor Day; no class
- **DROP DATE IS WEDNESDAY, SEPT. 4TH**
- *handout PS no. 1 on Wednesday*
- Quiz no. 1 - last 30 minutes of class on Wednesday

Week 04, 09/09 - 09/13: Probability & Discrete Probability Distributions

- Text: Sullivan ch. 5-6
- PS no. 1 due at beginning of class on Wednesday

Week 05, 09/16 - 09/20: Normal Probability Distribution

- Text: Sullivan ch. 7
- Quiz no. 2 - last 30 minutes of class on Wednesday

Week 06, 09/23 - 09/27: Sampling Distributions

- Text: Sullivan ch. 8

Week 07, 09/30 - 10/04: Estimating the value of a Parameter

- Text: Sullivan ch. 9
- *handout PS no. 2 on Monday*
- Quiz no. 3 - last 30 minutes of class on Wednesday

Week 08, 10/07 - 10/11: Midterm Week

- Monday
  - PS no. 2 due at the beginning of class. We will go over it as a review. We can also cover any questions, points of confusion, etc.
- Wednesday
  - **Midterm Exam**. Math and theory based questions to be done in class. No software required. Open note.

Week 09, 10/14 - 10/18: Hypothesis Tests

- Text: Sullivan ch. 10

Week 10, 10/21 - 10/25: Inferences on Two Samples

- Text: Sullivan ch. 11
- Quiz no. 4 - last 30 minutes of class on Wednesday

Week 11, 10/28 - 11/01: Inference on Categorical Data

- Text: Sullivan ch. 12

Week 12, 11/04 - 11/08: Comparing Three or more Means

- Text: Sullivan ch. 13
- *handout PS no. 3 on Wednesday*
- Quiz no. 5 - last 30 minutes of class on Wednesday

Week 13, 11/11 - 11/15: Correlation and Regression

- Text: Sullivan chs. 4, 14
- PS no. 3 due at the beginning of class on Wednesday.

Week 14, 11/18 - 11/22: Non-parametric statistics

- Text: Sullivan ch. 15
- *handout PS no. 4 on Wednesday*
- Quiz no. 6 - last 30 minutes of class on Wednesday

Week 15, 11/25 - 11/29: Fall Break

Week 16, 12/02 - 12/06: Review Week

- Monday
  - PS no. 4 due at the beginning of class. We will go over it as a review. We can also cover any questions, points of confusion, etc.
- Wednesday
  - `Stata/R` review. Let's make sure you know the commands you are most likely to need for the final exam.

Week 17, 12/09 - 12/13: Final Exam week

- Per University scheduling [1] - the exam time for this class is ***Monday, December 9th from 2:00pm to 4:45pm***. To be completed at the Testing Center. Exam will cover applied knowledge using `Stata/R`. Follow all applicable rules regarding the registration for a seat.

[1] which can always change!