University of Texas at Austin
GOV 350K: Statistical Analysis in Political Science (38615)
Spring 2021, TTH 5:00PM-6:30PM

Instructor: Tse-min Lin <tml@austin.utexas.edu>
Online Office Hours: MW 2:00-3:30pm <https://utexas.zoom.us/j/5757438701>
Teaching Assistant: TBA
Online Office Hours: TBA

Quantitative Reasoning Flag

This course carries the Quantitative Reasoning Flag. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

Course Overview:

This course introduces basic concepts and methods of statistics. Unlike the typical elementary statistics courses you may have taken, the emphasis here will be on applications in political science. The objective of this course is to help students acquire the literacy for understanding political science literatures based on the scientific approach, as well as to prepare interested students for more advanced methods courses. Topics include descriptive statistics, probability and probability distributions, sampling, sampling distribution, point estimation, confidence intervals, hypothesis testing, analysis of variance, contingency tables, correlation, and simple regression. You will also learn how to use the computer software R to analyze data.

Grading Policy:

Homework Assignments (6 sets): 5% each set
Midterm Exam (Week 8, date/time to be scheduled): 30%
Final Exam (Week 16, TH May 6): 30%
Instructor's Discretion (attendance, participation, etc.): 10%

Notes: (1) Attendance and participation during scheduled sessions are strongly encouraged. (2) Please show your face when the instructor speaks to you or when you speak. (3) You are allowed to work together on homework questions, but you should write your assignments independently. Suspected issues of academic dishonesty may be referred to Student Judicial Services. (4) Both the midterm and the final are cumulative. (5) Plus/minus grades will be assigned for the final grade.

Required Texts:

[W&W] T. H. Wonnacott and R. J. Wannacott. 1990. *Introductory Statistics*, 5th Ed. Wiley.

[JSTOR]/[Canvas] In addition, a number of journal articles and book chapters are assigned as required readings. Most of these papers are political science applications of the statistical methods to be introduced. These papers are included primarily for use in homework assignments, and they often include parts that are beyond the scope of this course. These readings will be discussed in class only if time allows. Most of the papers are available online at JSTOR <www.jstor.org>; others will be posted on Canvas <canvas.utexas.edu>. Reading these materials will help you get a better grip on the statistical concepts and methods introduced in this class.

Students with Disabilities:

Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 512-471-6259. For more information, visit http://diversity.utexas.edu/disability/.

Policy on Academic Integrity:

Students who violate University rules on academic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and / or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on academic dishonesty will be strictly enforced. For further information, please visit the Student Conduct and Academic Integrity website at: http://deanofstudents.utexas.edu/conduct/

Accommodations for Religious Holidays:

By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

Emergency Evacuation Policy:

Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside. Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building. Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.

In the event of an evacuation, follow the instruction of faculty or class instructors. Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.

Behavior Concerns Advice Line (BCAL): 512-232-5050
Emergency Information Web Site: http://www.utexas.edu/emergency

Course Outline and Reading Assignments:

Week 1 Introduction
1/19, 1/21: Introduction
Lecture Note No. 1/1A: Introduction

Week 2 Univariate Descriptive Statistics
1/26: W&W, Chapter 1.
1/28: W&W, Chapter 2.
Lecture Note No. 2: Levels of Measurement and Descriptive Statistics
Lecture Note No. 2A: Quartiles for Grouped Data

Week 3 Univariate Descriptive Statistics
2/2, 2/4: R Computing
Lecture Note No. 3: Download/Install R & R-Studio for Statistical Computing
Lecture Note No. 4: An Example of Statistical Computing: Height and Longevity
Lecture Note No. 5: The 1984 General Social Survey
Lecture Note No. 6: Coefficient of Variation (For Reference Only)

Week 4 Probability
2/9: W&W, Sections 3-1, 3-2, 3-3, 3-4, 3-5.
2/11: [JSTOR] Davis and Davenport, 1999. "Assessing the Validity of the Post-Materialism Index." *APSR*, 93(September).
Lecture Note No. 7/7A/7B/7C: Random Variables and Probability Distributions

Week 5 Probability Distributions
2/16: W&W, Sections 4-1, 4-2, 4-3.
2/18: W&W, Sections 4-4, 4-5, 4-6.
Lecture Note No. 8/8A: The Binomial and Normal Distributions

Week 6 Probability Distributions
2/23: W&W, Sections 5-1, 5-2, 5-3.
2/25: W&W, Sections 5-4.
Lecture Note No. 9/9A/9B: Probability Theory
Lecture Note No. 10/10A: Joint Probability Distribution

Week 7 Sampling
3/2, 3/4: [Canvas] Goel (1988), "Sampling." Chapter 5 of his *Political Science Research*.
Lecture Note No. 11/11A: Sampling

Week 8 Midterm Exam
3/9, 3/11: Midterm Exam (date/time to be scheduled)

Week 9: Spring Break

<u>Week 10</u> Confidence Interval for Sample Proportion

3/23: W&W, Sections 6-1, 6-2, 6-3, 6-4.
3/25: W&W, Chapter 7.
Lecture Note No. 12: Statistical Inference – Confidence Intervals
Lecture Note No. 12A: Sampling Distribution
Lecture Note No. 12B: Point Estimation (Optional)
Lecture Note No. 12C: The Notion of Margin of Error

<u>Week 11</u> Confidence Interval for Sample Mean
3/30: W&W, Sections 8-1, 8-2, 8-5.
4/1: W&W, Sections 8-3, 8-4.
[Canvas] Sullivan et al., 1990. "Candidate Appraisal and Human Nature: Man and Superman in the 1984 Election." *Political Psychology*, 11:459-484.
Lecture Note No. 13: Sampling Distribution of the Sample Mean

<u>Week 12</u> Hypothesis Testing
4/6: W&W, Sections 9-1, 9-2.
4/8: W&W, Sections 9-3, 9-4.
Lecture Note No. 14: Hypothesis Testing
Lecture Note No. 15: One-Tailed Test

<u>Week 13</u> Hypothesis Testing
4/13: W&W, Section 9-6.
[JSTOR] Krehbiel, 1990. "Are Congressional Committees Composed of Preference Outliers?" *APSR*, 84:149-163.
4/15: W&W, Sections 10-1.
Lecture Note No. 16: 2-Sample t Test
Lecture Note No. 17: Statistical Inference of Means/Proportions

<u>Week 14</u> One-Way Analysis of Variance (ANOVA)
4/20, 4/22: W&W, Sections 10-1.
Lecture Note No. 18: Comparing Means of Three or More Independent Samples (ANOVA)

<u>Week 15</u> Chi-Square Test
4/27, 4/29: W&W, Chapter 17
Lecture Note No. 19: Level of Measurement and Statistical Procedures
Lecture Note No. 20: Measures of Association – Chi Square Test

<u>Week 16</u> Review & Final Exam
5/4: Review & Catch-up
5/6: Final Exam