BUSH 635-603: Quantitative Methods II: Policy Analysis
Spring 2016
Time: Friday 1:30-4:20pm
Location: Allen 1063

Instructor: YuJung (Julia) Lee
E-mail: yujunglee@tamu.edu
Office: Allen 1033
Office Hours: Thurs. 3-4:30pm or by appointment
Course website: available on eCampus

<u>**Required Materials:**</u>
1. Stock, James H. and Mark W. Watson. 2011. *Introduction to Econometrics*. Third Edition. Pearson Education. ISBN: 0138009007.
2. Acock, Alan A. *A Gentle Introduction to Stata*. Any edition.
3. STATA Statistical software, Stata/IC version 14. See:
    www http://www.stata.com/order/new/edu/gradplans/gp-campus.html
4. Additional readings will be made available on eCampus.

Recommended Materials (optional):
1. Angrist, Joshua A. and Jörn-Steffen Pischke. 2008. *Mostly Harmless Econometrics: An Empiricist's Companion.* ISBN: 978-0691120355.

<u>**Course Description:**</u>
This course is a continuation of Bush 631, the statistics class. The goal of this course is to prepare you to analyze public policy using quantitative social science research methods. This class will further 1) develop your analytic skills for use in public affairs and collective decision making, 2) improve your research design skills, 3) assess the validity and limits of information presented to you, 4) improve your ability to manage and analyze data, and 5) give you a thorough grounding in basic regression analysis. As such, there will be a strong emphasis on conceptual understanding and application rather than on theory.

This course will cover the tools and techniques of quality research design as well as more advanced analysis skills designed to give you the ability to process information in a useful and correct manner. This course will also help you to become proficient in the use of the STATA statistical software package. As a policymaker in the public, non-profit, or private sector, you will find these skills to be invaluable as you make recommendations, decisions, and attempts to persuade others.

Key topics to be covered will include: research design, sampling, hypothesis testing, assumptions of linear regression analysis, multiple regression, validity, panel data, instrumental variables, probit and logit, quasi-experiments, and time-series regression.

Not all textbook and homework material will be covered in class. The lectures may also include material not covered in the text. Therefore the optimal approach to mastering class material

includes studying class notes, homework assignments, and the assigned textbook and other readings. Please bring your laptop and Stata to class, but keep your laptop closed when Stata is not being used for instruction.

After successful completion of this course, the students will be able to:
1. Have a deeper understanding of multivariate regression analysis, and understand how it relates to t-tests, correlations, and other methodological techniques.
2. Have a deeper understanding of confounds/endogeneity and methods of correcting for them/it.
3. Understand the limits of linear regression and the estimation strategies used when linear regression is not appropriate. These can include, but are not limited to: non-linear regression, probits, and logits, logs, quadratics.
4. Understand how quantitative methods can help with program evaluation.
5. Have a more thorough mastery of STATA.
6. Apply #1-5 in program evaluative settings.

Course Requirements and Grading:
Course Requirements: Your success in the course depends on attending class regularly, taking thorough notes, and spending time on the assignments. Students should read the assigned chapters *before* coming to each class. The final grade is based on:

Weekly Problem Sets	25%
Group Presentation	5%
Individual Mini-Projects	25%
Mid-term Exam (in class)	20%
Final Exam (take home)	25%

Attendance is required. One lowest problem set grade will be dropped. University rules regarding excused and unexcused absences can be found at: http://student-rules.tamu.edu/rule07

Note on Problem Sets and Group Work: Group work on mini-projects or exams is not allowed unless specified. On the Problem Sets, however, I encourage you to work with your classmates, or at the very least to check your work with classmates before turning assignments in. Although group work is encouraged, *your write-up of your homework must be your own*. To get full credit, you must show the work you did to get an answer in addition to giving the correct answer. All Stata and Excel work must be documented so that it communicates what you are doing to an outside viewer. Communication skills are important in public service.

Group Presentation: You will be required to make one group presentation in class. The purpose of the presentation is to learn how to communicate statistics effectively and be comfortable reading papers with statistical analysis by presenting the work of an existing scholarly paper that uses statistical techniques relevant to our class. The paper may be from an academic journal or from seminars at our department (working papers). You should try to present a paper on a topic that your group members are interested in. Send me the title of the article a few days before your

presentation by email, and I will make it available to everyone. Each group should be 2-3 people. In your presentation you should identify the research question, provide context on the subject, describe the applied quantitative method (including how variables are measured), summarize the results, and discuss the relevance of the evidence to policy. Your presentation should be 10 to 15 minutes.

Mini-Projects: You will be required to conduct two mini-projects throughout the course. The general purpose of these Mini-Projects are to work with real data and perform your own statistical analysis using STATA. In Mini-Project I, you will be given data to analyze (10%). Mini-Project II is a replication project where you need to find a scholarly article you are interested in that uses statistical analysis, obtain data, and replicate their findings (15%). I will provide further details of each Mini-Project during the semester.

Midterm In-Class Exam: You will be allowed a calculator and one 8 ½ by 11 inch "cheat sheet" of hand-written notes for the exam. If you are not available during this time period, please let me know at least a week before the exam.

Extra Credit: There is no extra credit for this course.

Late work policy: Hard copies of all your work must be submitted by the due date. Please do not email your work to me. Late problem sets will **not** be accepted. Late presentations/mini-projects will be downgraded half a letter per day (i.e. A to A- or about 4% per day). In the case of an emergency or excused absence (ex. hospitalization, family death), accommodations may be made with timely notification and appropriate documentation.

Challenging a grade: Homework assignments and exams will have answer keys posted on the course website or available in class after grading is complete. You are STRONGLY encouraged to compare your work with the answer key soon after the assignment has been returned. If you feel that your assignment has been graded incorrectly after comparison with the answer key, please submit a *typewritten statement* to my mailbox with the exam or assignment explaining the point of contention *within 4 days* of the class period in which homework or exam was returned to the class. Note that your entire assignment is then subject to being re-graded and your grade may actually decrease.

Note on Office Hours: I feel strongly that you should work on the material in the course throughout the week. Therefore, I strongly encourage you to come to my office hours should you need help. However, I will **not** be available on the weekend for questions. I encourage you to get started on your homework and identify trouble spots long before each homework is due.

Classroom Policies and Communication
Honor Code: "An Aggie does not lie, cheat or steal or tolerate those who do." Every student, graduate as well as undergraduate, is expected to adhere to this code; violation can result in disciplinary action. More information about Honor Council Rules and Procedures can be found at http://www.tamu.edu/aggiehonor.

Students with Disabilities: 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.

Cheating or Plagiarism: All work submitted in this course must be your own work, produced exclusively for this course. The use of someone else's ideas, quotations, music, graphs/charts, and/or paraphrases must be properly documented, even if you have the permission of that person. Direct quotes must be in quotation marks and have the page number in the citation. ***Plagiarism will result in a zero for the assignment and may result in a failing grade for the class.*** Violations may also be noted on student disciplinary records. If you are in doubt regarding any aspect of these issues, please consult with the instructor *before* you complete the relevant assignment.

Course Schedule –Schedule is subject to change. Any changes will be announced in class.

Week#	General Topic	Specific Topics	Reading	Due Dates
Week #1 1/22/16	Review of designing empirical studies, probability, statistics	How to answer a question using data, expected value, sampling distribution, intuition behind hypothesis testing	S&W 1 & 2 & 3	Problem Set 0 assigned (nothing due next week)
Week #2 1/29/16	Bivariate Regression	Using the data to compare means, Ordinary Least Squares, bivariate regression with a dummy variable	S&W 4 & 5	
Week #3 2/5/16	Multiple regression I	The model with other explanatory variables, omitted variable bias, multicollinearity, goodness of fit	S&W 6	Problem set 1 due
Week #4 2/12/16	Multiple Regression II	Hypothesis testing, Joint hypotheses tests	S&W 7	Problem set 2 due
Week #5 2/19/16	Multiple Regression III	Model specification, examples	S&W 7	Group presentations start! Problem set 3 due
Week #6 2/26/16	Linearity/Non-linearity I	Working with dummy variables, interactions	S&W 8	Mini-Project I due Problem set 4 due
Week #7 3/4/16	Non-linearity II & Assessing regression studies	logs, quadratics, interpretation of regression coefficients under different functional forms, validity	S&W 8 & 9	Problem set 5 due
Week #8 3/11/16	Midterm			
Week #9 3/18/16	Spring Break!	How's that summer internship search?		
Week #10 3/25/16	Reading day			
Week #11 4/1/16	Panel data: fixed effects	Multiple observations on the same units	S&W 10	
Week #12 4/8/16	Binary dependent variables: probit and logit	Dummy variables as dependent variables	S&W 11	Problem set 6 due
Week #13 4/15/16	Instrumental variables	Two Stage Least Squares	S&W 12	Mini-project II due Problem set 7 due
Week #14 4/22/16	Experiments and "Natural Experiments"	Diff-in-diffs	S&W 13	Problem set 8 due
Week #15 4/29/16	Intro. to Time Series regression	autoregression, stationarity	S&W 14	Problem set 9 due
Week #16 5/3/16	Continued/Review/Catch-up			Final Due May 9th 10a.m.