PLS510

Advanced Research Method II

Spring 2018 | WE 12:00–14:50 | Room 8.309

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Course Description

Statistical models are widely used across diverse disciplines of social sciences. This course is designed to equip students with proper skills and understandings of quantitative methodologies in political science. Building upon the foundations of Advanced Research Methods I, we will further engage in the quantitative method and learn necessary skills and knowledge in order to conduct rigorous empirical research as well as to understand quantitative works of political science. Since the emphasis of this course is on an actual conduct of empirical research using statistical modeling, we will walk through a generic process of empirical studies with the emphasis placed on the use of OLS. Students are expected to follow each stage of the process in order to complete this course. There is no prerequisites in terms of mathematics background. However, I expect students are familiar with basic concepts from a positivist approach of scientific research, such as variables, covariance, causal inference and samples. Some contents of the course will include basic math.

Course Learning Objectives (CLOs)

By the end of this course, student will be able to:

- Read, understand and evaluate research designs and methods used in political science literature (PLO 1, 2)
- Generate hypotheses and design research to test them (PLO 1, 2, 4)
- Present research ideas and findings in a coherent and organized manner (PLO 3)
- Learn to work independently (PLO 6)

Textbook

We will use following books for the main textbooks of this course. I also list recommended books for further studies on statistical analysis. All the required readings are accessible electronically on the Moodle (❖=required; ❂=recommended).

- ❖ Kellstedt, P.M. and Whitten, G.D. (2009) *The Fundamentals of Political Science Research.* Cambridge University Press (ISBN: 978-1107621664).
- ❖ Kaplan, Daniel. (2012) *Statistical Modeling: A Fresh Approach* (2nd edition). Project Mosaic (ISBN: 978-1448642397).
- ❂ Wong Dona M. (2010) *The Wall Street Journal Guide to Information Graphics: the Dos and Don'ts of Presenting Data, Facts, and Figures.* W.W.Norton & Company (ISBN: 978-0393072952).
- ❂ Brians, Craig L., Lars Willnat, Jarol B. Manheim and Richard C. Rich. (2011) *Empirical Political Analysis* (8th edition). Longman (ISBM: 987-0205791217).

Statistical Package

The coure is mainly taught in the form of lecture. However, there will be a few lab sessions that we use STATA (a statistical package). I will introduce the package and some basic commands to use it. We will only use the package for basic and simple functions and will not do any programing tasks. STATA has built-in help function with detailed instructions in case you need assistance. However, there are many online sources you can consult:

- UCLA Institute for Digital Research and Education (www.ats.ucls.edu/stat/stata)
- UNC Carolina Population Center (www.cpc.unc.edu/research/tools/data_analysis?statatutorial/)
- Princeton Data and Statistical Services (www.princeton.edu/∼otorres/Stata)

Course Tasks

Homework assignments (10%) There will be a take-home assignment on a weekly basis. Homework questions will be based on reading assignments, core statistical concepts, applications of those concepts, exercise problems, and lab assignments. These assignments will help students understand the material and prepare for exams. Unless otherwise noted, all homework assignments must be submitted at the beginning of the class. Late submission or extension is not allowed for any reasons. No exception.

Replication paper (30%) All students must choose one existing empirical research that uses quantitative methods and conduct a replication of that research. You can either utilize the original data or update the data to test the original work. The main goal of this assignment is to get familiarized with the idea of quantitative methods. The choice of work is up to students, but I recommend that they should choose something interests their own research (e.g. related to the student's thesis topic).

Research design paper (30%) It is required to complete a research design paper, in which a student must demonstrate the ability to design an empirical research on political science questions. The paper will be graded at each stage of progress (research question, literature review, hypotheses, data, statistical model). Details will be provided in the class.

Exams (30%) There will be three exams in this course. All of exams are *cumulative*, meaning that the exam will cover everything that was taught up to the point of the exam dates. The first exam (5%) is scheduled on 14 February (week 6), the second exam (10%) on 4 April (week 13), and the third exam (15%) during the final period (the exact date is TBA).

Grading Policy

Grading scale The final grade is determined by the student's overall performance of all course requirements in absolute terms, not relative. Following the University's grading scheme, a student's final grade will be given by taking the percentage of points earned by the students to the following scale:

Composition		Scale					
Exams	30%			**A**	95-100	**A**$^-$	90-94.9
Research Design Paper	30%	**B**$^+$	85-89.9	**B**	80-84.9	**B**$^-$	75-79.9
Replication Paper	30%	**C**$^+$	70-74.9	**C**	65-69.9	**C**$^-$	60-64.9
Homework assignments	10%	**D**$^+$	55-59.9	**D**	50-54.9	**F**	<50

Late submission I accept late submissions *only* for paper assignments (no late submission is allowed for homework assignments). A late submission of a paper assignment will be penalized by a 10% deduction of the original points for each day (or part of a day). If you turn in your paper in 2 days passed the due, the highest point you can receive is 80%. If your submission is late five or more days, it will *not be accepted*.

Cheating This will never be tolerated. During exams, students will receive a warning if they behave or are suspected to behave abnormally. Students who receive a second warning will receive *zero* point for that exam.

Re-grading Students can request re-grading of their homework assignments within one week after it is returned. Such a request must be made by a *written* request (a re-grading request form is available on Moodle), describing reasons of re-grading. Note that the entire of the requested assignment, not a specific part, will be re-graded and that the new grade may be lower than the original one. There will be no re-grading of once re-graded assignments.

Others I do not give a curve to any assignments. There is no make-up or extra credit assignment.

Academic Integrity Policy

Students must become familiarized with the NU Student Code of Conduct and Disciplinary Procedures, which is the official document outlining policies and procedures about academic misconduct. Here are links to important NU policies:

- Academic policies and procedures for undergraduate programs (English/Russian).
- Student code of conduct and disciplinary procedures (English/Russian).
- Undergraduate attendance policy and procedures (English).

Fraud This refers to any attempts to deceive the student's original status of works and/or efforts, including cheating during any types of tests, forgery of documents, and fake attendance. Punishment for fraud and cheating is as follows:

- **Fraud check-in** will result in a zero point for the student's attendance score after one class-wise warning.
- **Cheating** refers to a use and/or a suspected use of unauthorized assistance or an intentional noncompliance with the in-class test rules. For instance, chatting with a classmate also constitutes an act of cheating, regardless of the content of the conversation.
- **Forgery** is a serious crime. This may result in a policy investigation. If a forgery or an attempt of forgery is found, I have to report to the authority to prevent further consequences. This will result in a course failure and a possible expulsion from the University.

Plagiarism This is a crime. A plagiarism is defined as "an act of using someone else's ideas or words as if they were your own without appropriate acknowledgement or quotation marks." Following the NU guidelines and the Student Code of Conduct, I use three categories of punishment.

- **Category A** is to be filed when minor plagiarism is suspected (e.g. one paragraph, or 3-4 consecutive sentences). For category A, the student will get zero point for that assignment.
- **Category B** is to be filed when a significant amount of the student's assignment/work is suspected to be plagiarized (e.g. one page, or more than two paragraphs). For category B, the student will fail this course and possible disciplinary actions will be enforced by the University.
- **Category C** is to be filed when the entire work of the students is suspected. For this type of misconduct, the student may be expelled from the University.

Attitude Students are responsible for their behavior, which often have a significant impact on the entire class. Use your common sense before you act to judge if your action to be taken is appropriate. I expect all student in this course will follow Some basic rules as illustrated in below. A serious violation of any of those will result in a course failure.

- The official language of teaching/learning is English across the NU.
- Students must show proper respect to each other.
- Physical and/or verbal violence is never tolerated under any circumstances.
- Both the instructor and students should comply to course policies as well as the University regulations

Attendance Policy

I may not take attendance in every class meeting. However, this does not mean that attendance is least important in this course. To the contrary, attendance is crucial in this course because of the way this type of course is taught: a block-building or step-by-step process of digesting material. If you miss one class, it could be impossible for you to catch up the rest of the course without fully grasping the content and material of the missed class. So, if you missed more than 20% of this course, it will automatically result in a course failure (excused absence is not counted).

Excused absence Absence is excused only for reasons stated below. Students are responsible for providing proper documentations and notification. If proper documentations are not provided, it will not be excused.

- Medical excuses (students' own illness)- Required is proper medical notes or documents. It must be submitted through the student services within one week from the (last) date of absence. Otherwise, absence will not be excused.
- University events - The student must notify me (not TA) of any preplanned activities imposed by the NU or other equivalent entities, *excluding* works and internship. Such notices must be delivered to and cleared by me at least one week prior to the date of absence.
- Family emergencies - In cases of *accidents* that have direct influence on the student's immediate family member(s) or co-residing member(s), the student's absence will be excused only after proper documents are provided through the student services.

Other Policies

Technologies in class Unless you are instructed otherwise, the use of following items are *prohibited* during the class: cellphones, tablets, laptops, and other sound-producing devices. Use pens and notebooks for note taking, which indeed enhances the learning process in a longer-term. There is a scientific proof that handwriting makes you smarter. Here is a link to an article from the Wall Street Journal.

Communications If you need to meet me in person, you can visit during office hours, or write an email to make an appointment. All appointment must be made through email, not verbally.

Assistance for physical/mental needs If a student needs a special attention due to his/her own physical or mental conditions, the student is responsible for notifying the instructor in the beginning of the semester. If necessary, the instructor can demand official documentation on the student's condition. Upon such requests, the student should provide appropriate record/proofs of the condition. If not provided, such needs may not be considered at all.

Changes to syllabus The instructor reserves the right to make changes to the syllabus. Any changes will be communicated in class and via Moodle.

Course Schedule

Course schedules are subject to change. Any changes will be notified at least one week prior to the original schedule. All assigned readings are available on Moodle. Students must complete reading assignments.

Week 1. Model Thinking

Kaplan, chapter 1; Kellstedt & Whitten, chapter 1

- Course introduction
- Scientific Research (review of PSRM)
- Models of Politics
- Causation and correlation

Week 2. Data, Variables and Research Design

Kaplan, chapter 2; Kellstedt & Whitten, chapter 4

- Types of variables
- Unit of analysis
- Experimental versus observational design
- Population, samples and sampling
- **Research design paper:** research question due (Moodle)

Week 3. Descriptive Statistics

Kaplan, chapter 3; Kellstedt & Whitten, chapter 5

- Coverage intervals
- Means, medians, percentiles
- Variance, standard deviations
- Histogram, box plots, scatter plots
- **Homework 1 due (in-class)**
- **Replication paper:** detailed summary (in-class)

Week 4. Explaining Variation

Kaplan, chapter 4; Kellstedt & Whitten, chapter 5.

- Partitioning property of variance
- Group-wise models
- Spurious relationships and confounding variables
- Intervening variables
- **Homework 2 due (in-class)**
- **Research design aper:** introduction due (Moodle)

Week 5. Confidence Intervals

Kaplan, chapter 5; Kellstedt & Whitten, chapter 6.

- Sampling distribution
- Bootstrapping
- Standard error
- Confidence levels and intervals
- **Homework 3 due (in-class)**
- **Replication paper:** replication or extension of data (Moodle)

Week 6. Review & Exam I

Kaplan, chapters 1 through 5; Kellstedt & Whitten, chapters 4 through 6

- Review of material between week 1 and 5
- **Homework 4 due (in-class)**
- **Exam I (in-class)**

Week 7. Building a Statistical Model

Kaplan, chapters 6 and 7; Kellstedt & Whitten, chapter 8

- Model formula (coefficients, terms, model values)
- Conditional relationships
- Interactive models
- **Replication paper:** descriptive statistics of data (Moodle)

Week 8. Model Fitting and Total/partial Relationships

Kaplan, chapters 8, 9 and 10; Kellstedt & Whitten, chapter 8

- OLS
- R-squared, root-MSE
- Nested models
- Correlation
- **Homework 5 due (in-class)**
- **Research design paper:** hypotheses due (in-class)

Week 9. Quantifying Confidence in Estimates and Models

Kaplan, chapter 12; Kellsted & Whitten, chapter 9

- Standard error
- Measurement error
- Multicollinearity problem
- **Homework 6 due (in-class)**

Week 10. Review & Exam II

Kaplan, chapters 6-10 and 12; Kellstedt & Whitten, chapters 8 and 9

- Review of material between week 7 and 9
- **Homework 7 due (in-class)**
- **Exam II (in-class)**
- **Research design paper:** peer review due (Moodle)

Week 11. Spring break

- No class meetings in this week.
- Happy Nauryz!

Week 12. The Logic of Hypothesis Testing

Kaplan, chapter 13; Kellstedt & Whitten, chapter 7

- Null and alternative hypotheses
- p-value
- Type I and II errors
- Significant level
- **Replication paper:** Initial report (Moodle)

Week 13. Interpreting Statistical Models

Kaplan, chapters 14 and 15; Kellstedt & Whitten, chapter 9

- R-squared and F statistics
- Significance and substance
- Conditional relationships
- Interactive models
- **Homework 8 due (in-class)**
- **Research design paper:** 1st draft due (Moodle)

Week 14. Linear Probability Model

Kaplan, chapter 16; Kellstedt & Whitten, chapter 11

- Linear probability model
- Predicted probabilities
- Link values and functions
- Maximum likelihood estimation
- **Homework 9 due (in-class)**
- **Replication paper:** final submission (Moodle)

Week 15. Review III

Kaplan, chapters 13 through 16; Kellstedt & Whitten, chapters 7 through 11

- Review of materials between week 12 and 14
- **Homework 10 due (in-class)**
- **Research design paper:** final submission (Moodle)

Final exam

The date and location for the final exam will be posted on the Moodle.