Syllabus

PLS211 – Quantitative Methods in Political Science

Instructor: Dr. Willardson
Course: Quantitative Methods
Class: Tu/Th 1330-1445 in 8.305
Office 8.217
Office Hours: Th. 9:00-12:00 and by appt.
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Course Objectives

The objective of this course is to provide students with the requisite statistical understanding to consume political science research, understand statistical information in their daily lives, and to produce statistical results (including tables and figures) from political science data.

Course Description

This course is designed to give students the requisite quantitative skills to understand social science research and to produce their own statistical results using statistical models and visualizations. The primary goal of the course is to give students a fundamental knowledge of basic statistics. The secondary goal is to introduce students to statistical computing in the context of research design, data collection, data summary, and model building. This course is also designed to equip students with real-world skills in understanding basic computational tools for statistical analysis. Classroom instruction will use the `R` statistical package to demonstrate statistical computing. Students may use any software to produce their own results, but their work will need to be shown in the form of a batch file (do file in STATA) or a description of cell manipulation in Excel, for example. By the end of the course, students will understand basics of setting up their own research question and design, and will be able to use either the `R` to apply statistical tests to data.

Required Textbooks

Levin, Jack, James Alan Fox and David R. Forde. 2010. *Elementary Statistics in Social Resarch, 11th Edition*. Pearson[1].

Schumacker, Randall E. 2015. Learning Statistics Using R. Sage. (Excerpts of this book are available on Moodle.)

Grading

Your overall grade for the course will be determined by the cumulative points that you earn on assignments, exams, participation, and attendance divided by the total number of points possible in the course. Grades are assigned using the following scale:

Letter Grade Distribution:

[1] Due to extra students in the course, some students may need to use an electronic version or share textbooks.

Table 1: All Graded items and Total Points for Course

Item	Due	Points Possible
Participation	Ongoing	50
Midterm Exam 1	Week 6	100
Midterm Exam 2	Week 12	100
Final Exam	Finals Week (TBA)	100
Homework Assignments	Ongoing	100
Course Data Project	December 1	150
	Total Points	600

>= 93.00	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	<= 62.99	F
77.00 - 79.99	C+		

Table 1 shows the graded items and their total points for the class. A description of these graded items is found in the next section. Your grade will be calculated by totaling the number of points earned by you on each of the graded items and dividing that total number by 600 total points for the course.

Description of Assignments

Participation

Student participation in class will consist of multiple measures. The main thing to understand is that you cannot participate if you are not present. In class I will demonstrate the math, the computer programs, and the other skills that you will need to complete assignments and pass the exams. We will occasionally have in class activities that will be marked for participation.

Homework Assignments

In this course we will have regular homework assignments due. This homework is meant to reinforce the concepts that we are learning, to give you practice working the problems, and to help you think through the issues related to statistical thinking. Homework will be graded for correctness, but I don't just want answers written on a paper. I want to see the process through which you went to arrive at the solution. In other words, homework is not meant to be the "clean book" of work that you may have handed in math courses in school. I suggest that you use a *pencil* to do your calculations. If you use a pen, please cross through (once) any mistakes and then continue with the problem. You may work together in pairs or small groups, but each person is responsible to write out the problems, work, and solutions. **If you work as a part of a group, make sure that you understand all of the problems that you are working on.** Homework is meant to prepare you for the exams. You will notice that the most points in the class are allocated based on the exams. Turning in homework will help you, but not understanding what you've turned in will ultimately hurt you. **Homework is due at the beginning of the Thursday class the week it is due.**

Exams

The course has 2 midterm exams. These exams will consist of some combination of multiple choice, short answer, and work problem questions. Exams will be given during the Thursday class of the week they are listed in the course schedule. This course also has a final exam. I will announce the date of the final exam once the registrar releases the final exam schedule during the semester. The final exam will be part comprehensive and part new material. It will focus on the new material covered after the second midterm exam. I will also ask general questions about concepts covered throughout the course.

Course Data Project

On the last day of the course each student will turn in a data project. The data project is described in greater detail in the appendix at the end of this syllabus. I will discuss the project at length after fall break.

Course Schedule

Table 2 shows an outline of the topics and deadlines for the course. See the next section *Readings* for each week's reading assignments.

Table 2: Course Schedule By Week

Week	**1st Class**	**Topic**	**Deadlines**
1	8/18	Why we Use Statistics – Introduction to R	
2	8/25	Organizing Data	Homework 1
3	9/1	Measures of Central Tendency	Homework 2
4	9/8	Measures of Variability	Homework 3
5	9/15	Probability and the Normal Curve	Homework 4
6	9/22	Midterm Exam 1	
7	9/29	Samples and Populations	Homework 5
8	10/6	Testing the Difference between Means	Homework 6
9	10/13	*Fall Break*	
10	10/20	Analysis of Variance	Homework 7
11	10/27	Non-Parametric Tests of Significance — Non-Parametric Measures of Correlation	Homework 8 - Data Project Proposal
12	11/3	Midterm Exam II	
13	11/10	Regression Analysis	Homework 9
14	11/17	Regression Analysis II	Homework 10
15	11/24	Applying Statistics	
16	12/1	Wrap-Up	Data Project

Course Readings

Week 1: Why We Use Statistics – Introduction to R

Tuesday: Levin Chapter 1.

Thursday: Schumacker Chapter 1. (Moodle).

Week 2: Organizing the Data

Tuesday: Levin Chapter 2.

Thursday: Schumacker Chapter 2. (Moodle).

Week 3: Measures of Central Tendency

Tuesday: Levin Chapter 3.

Thursday: None

Week 4: Measures of Variability

Tuesday: Levin Chapter 4.

Thursday: Quick R guides (Moodle).

Week 5: Probability and the Normal Curve

Tuesday: Levin Chapter 5.

Thursday: Schumacker Chapter 3. (Moodle).

Week 6: Midterm Exam I

Tuesday: Review.

Thursday: Exam.

Week 7: Samples and Populations

Tuesday: Levin Chapter 6.

Thursday: Schumacker Chapter 4. (Moodle).

Week 8: Testing the Difference between Means

Tuesday: Levin Chapter 7.

Thursday: Schumacker Chapter 7. (Moodle).

Week 10: Analysis of Variance

Tuesday: Levin Chapter 8.

Thursday: No additional reading.

Week 11: Non Parametric Tests of Significance - Measures of Correlation

Tuesday: Levin Chapter 9.

Thursday: Levin Chapter 12.

Week 12: Midterm Exam II

Tuesday: Review.

Thursday: Exam.

Week 13: Regression Analysis I

Tuesday: Levin Chapter 11.

Thursday: Schumacker Chapter 8. (Moodle).

Week 14: Regression Analysis II

Tuesday: Levin Chapter 11.

Thursday: Schumacker Chapter 16. (Moodle).

Week 15: Applying Statistics

Tuesday: Levin Chapter 13.

Thursday: Schumacker Chapter 13. (Moodle).

Week 16: Wrap Up

Tuesday: Review.

Thursday: Review

Policies

Attendance

Attendance in this course is necessary for student success. Any non-excused absence will be grounds for adjusting grades downward. Excused absences (such as documented illness, university-approved travel, etc.) must be cleared with Dr. Willardson as soon as possible. Students are responsible for making up work missed during absence. In-class quizzes cannot be made up due to an absence of any sort. Late work is penalized. Dr. Willardson reserves the right to grant an extension for work for absences that are cleared prior to occurring, or on the same day as class in the case of emergencies, but only in extraordinary circumstances.

Academic Dishonesty

Academic dishonesty will not be tolerated under any circumstances. All students have been notified of Nazarbayev Universitys Student Code of Conduct and you have agreed to follow the universitys standards. Plagiarism is defined as "intentionally or carelessly presenting the work of another as ones own." In short, all of the work you turn in for this class is expected to be yours and yours alone. Plagiarized work will receive a zero and students will be reported to university authorities. Lying about absences, illnesses, or other circumstances will also be considered as academic dishonesty.

Religious Holidays Policy

Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify Dr. Willardson of a religious holiday absence **prior to its occurrence.**

Office Hours

I hold regular office hours (indicated on the top of the syllabus.) Students are encouraged to come and see me during my office hours. I am also available by appointment, but I prefer that students come see me during scheduled office hours, if possible. I reserve the right to send students away who come and see me outside of office hours without an appointment. **Please be considerate of my time.**

Writing Center

Writing is a key component of your education at NU. Your grade is dependent on you turning in assignments that convey ideas clearly using standard language, format, citation style, etc. Students are encouraged to work with the writing center to improve their writing. I will use my discretion in requiring students to use the writing center if assignments are consistently poorly written. I will notify you in writing if I will require you to work with the writing center on future papers.

Extra Credit

I do not provide extra credit assignments for students. On occasion, I may award 2-5 extra credit points for students who are to class on time or who participate in outside class activities suggested by the professor (such as talks and presentations that relate to the course). This little bit of extra credit may amount to 1-2 percent of the total possible points. This allows students who are working hard to move up a grade if they are close to the border. I do not provide extra assignments to make up for missed or late work. Do not ask me about providing you extra credit. **The answer is no.**

Late Work

Work is due at the beginning of the class when it is due (see schedule). Work that is turned in after the beginning of class, later in the day is penalized by 5%. Each following day work is penalized by 15%. This penalty is calculated by taking the earned grade on the assignment and multiplying it by (1-% deducted). For example, a paper turned in on Thursday when it was due on Tuesday will be penalized 35%. If a student earned 85% for the work, the score, with late penalty applied,

would be $\approx 55\%$ $(.85 * (1 - 0.35))$ of the points possible for the assignment. **Turn your work in on time.**

Appendix: Data Project Description

The purpose of the data project is to put together the statistical and statistical computing elements of the course and to help students to know how to use these tools in doing their own research.

The main idea of the project is to use some data to try to answer a question. Students will submit their potential question, data source, and plan for analyzing the data to me during week 13 (see schedule.) The final project will include a brief write-up of the question and the results of the analysis. It will also include a digital zip folder in which the data, the batch file, and outputs for the write up are all included. We will be working with all of these elements in class so you should know how to do this by the end of the semester.

Students will be graded on the following elements:

1. Report is complete and professional.
   (a) Includes Works Cited
   (b) Data Accurately described
   (c) Writing is clear
   (d) Tables and Figures help to tell the story (answer the question.)
2. Data folder is complete
   (a) All elements are included (data, batch file, figures)
   (b) Elements can be run (Batch file analyzes data and produces figures)
   (c) Batch file includes comments to describe the analysis taking place.

Each element of the data project is something that we will be working on in class throughout the semester when we work with the `R` program.