

POLS 204— ADVANCED SOCIAL STATISTICS

Spring 2022

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Course Description

This course provides an introduction to econometrics. We will cover advanced issues in linear regression, and nonlinear models, such as logistic regression and probit. We will be using the R programming language to conduct statistical analyses. We will be doing lots of hands-on exercises. By the end of this course, students will have acquired the skills to test hypotheses and build models using continuous and discrete dependent variables. This course is strongly recommended for those who want to deepen their knowledge in data analysis which provides a foundation for more advanced data science techniques. This course will meet both online and in-class. There will be no zoom recordings for in-class sessions. The syllabus is subject to revisions with respect to updates in the health and safety regulations during the pandemic. Preliminary knowledge of R is a prerequisite.

Course Requirements

- Term project: 70%
- In-class presentation of project results: 10%
- Participation: 20%

Participation

You are expected to have active participation in class, such as asking questions, solving exercises etc. This requires coming prepared to the class(i.e., having read course material and being up-to-date with the R codes).

Attendance

You are expected to attend all of the classes to perform well in this course. Students cannot have more than two unexcused absences throughout the semester. Further absences (unless justified with an official medical report) will result in the deduction of 10% of the final course grade. Also, you are expected to be punctual. To be marked present, you should not have missed more than 10 minutes of the class.

Research project

Throughout the semester, you'll be working on a research project in groups, which you'll turn in, and whose findings you'll present on the last day of classes (notice that in-class presentations constitute 10% of the grade). For this assignment, each group is expected to find a different dataset that they are interested in exploring and testing hypotheses with. There are no limitations on what the dataset must look like except that it should help to answer a political science question (i.e., some super cool wine or yachting dataset you find on the Internet is not relevant). Make sure your dataset comes from a trustworthy source (you'll be noting the source of the data) and is collected with diligence. In the first part of the project, you are expected to turn in a regression analysis of your dataset. In the second part of the project, you'll conduct a logit or probit analysis. Notice that regression requires a continuous dependent variable, whereas logit and probit require a discrete one. Please choose your dataset accordingly. On the last week of the semester, each group shall present its findings.

Steps of research project

- Week 1: Agree on a topic and find a corresponding dataset
- Weeks 1-7: Run descriptive analyses & significance tests
- **Week 8: Turn in results of your analysis**
- Weeks 9-13: Formulate testable hypotheses and test them using your dataset. You are expected to present results on each type of model we cover in the course.
- Week 13: **Final report due.** Present findings in class

Cell phone policy

Cell phones must be turned off or be in the silent mode. Make sure you've turned your phones off BEFORE class. In case of an incoming call, I will stop the course and will consider the material of that week covered.

Make-up exam policy

If you miss a quiz and present an official medical report, you shall have an oral exam at the end of the semester over all course materials (in other words, no make-up quizzes or extra homework). Absences without a medical excuse will result in zero.

Behavioral expectations

All students are expected to help create an environment conducive to effective teaching and learning for all participants. Behavior that disrupts teaching and learning is unacceptable; accordingly, all face-to-face or online interaction should be civilized, respectful, and relevant to the topic. Diverse opinions and engaging argumentation are critical to the higher learning endeavor, but inappropriate behavior that disrespects others or inhibits others from learning may result in sanctions, including but not limited to the removal from the classroom and/or the course.

Plagiarism and Academic Honesty

Plagiarism is a serious problem and refers to dishonestly representing someone else's ideas as your own. Plagiarism is punished by disciplinary committee and usually results in an F as course grade and sometimes heavier penalties. All students must understand the meaning and consequences of cheating, plagiarism and other academic offences (<http://www.buowl.boun.edu.tr/students/favoidingplagiarism.htm>). The Department of Political Science and International Relations has the following rules and regulations regarding academic honesty.

1. Copying work from others or giving and receiving answers/information during exams either in written or oral form constitutes cheating.

2. Submitting take-home exams and papers of others as your own, using sentences or paragraphs from another author without the proper acknowledgement of the original author, insufficient acknowledgement of the consulted works in the bibliography, all constitute plagiarism.

3. Plagiarism and cheating are serious offenses and will result in:

a) an automatic F in the assignment or the exam,

b) an oral explanation before the Departmental Ethics Committee,

c) losing the opportunity to request and receive any references from the entire faculty,

d) losing the opportunity to apply in exchange programs,

e) losing the prospects of becoming a student assistant or a graduate assistant in the department.

The students may further be sent to the University Ethics committee or be subject to disciplinary action.

Required books

Imai, Kosuke. (2017) Quantitative Social Science: Introduction. Princeton University Press.

Heiss, F. (2020). Using R for introductory econometrics (2nd edition). Selbstverlag. <http://www.urfie.net/read/index.html>

Pawitan, Y. (2001). In all likelihood: Statistical modelling and inference using likelihood. Clarendon Press; Oxford University Press.

Hanck, C., Arnold, M., Gerber, A., & Schmelzer, M. (2021). Introduction to economics with R. Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

Schedule of Topics

Week	Topics
1	Introduction & review of R skills <i>Reading:</i> Heiss, pp. 7–33.
2	Sampling & probability distributions <i>Reading:</i> Imai, pp. 242–310.
3	Sampling II <i>Reading:</i> Heiss, pp. 48–61. Hanck et al., Ch. 2.
4	Descriptive statistics <i>Reading:</i> Imai, pp. 63–87. <i>Reading:</i> Heiss, pp. 61–70.
5	Regression I: single variable <i>Reading:</i> Heiss, pp. 81–105.
6	Regression II: multivariate regressions <i>Reading:</i> Heiss, pp. 105–129.
7	Regression II (Cont'd) <i>Reading:</i> Heiss, pp. 129–151.
8	Non-linear regression <i>Reading:</i> Hanck et al., Ch. 8.
9	Maximum likelihood & Logistic regression <i>Reading:</i> Pawitan, pp. 21–73 <i>Reading:</i> Heiss, pp. 253–263.
10	Logistic regression II
11	Probit Heiss, pp. 253–263.
12	Probit II
13	WRAP-UP