

EC320 Econometrics

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Office Hours: by appointment

Course Description

Econometrics is the application of statistical methods to analyze economic data. Hence, econometrics is essential to every branch of applied economics. In particular, econometrics methods are used to estimate economic relationships, test economic theories, and evaluate policies. The primary objective of the course is to introduce students to basic econometric techniques (mainly ordinary least squares regression) and demonstrate how to apply these techniques to analyze empirical data. Another important objective is to develop the students' critical thinking about statistical inference (what can and cannot be inferred from the data). Finally, the course will enable students to apply their knowledge in analyzing field data. To this end, some of the classes are devoted to working with statistical software (Stata). At the end of the course, students will have to demonstrate their econometrics skills by analyzing field data, presenting it to the class in a research workshop, and write a short research paper.

Learning Outcomes

- Introduce students to the problem of causal inference
- Introduce students to basic econometrics techniques
- Study how to apply econometrics analysis to economics questions
- Enable students to conduct basic econometric analysis using Stata
- Develop critical thinking about statistical inference

Textbooks

For this course, we will use the following textbook (there are copies in the library)

- *Principles of Econometrics (2018)* by R. Carter Hill, William E. Griffiths, and Guay C. Lim (John Wiley & Sons).

Three excellent textbooks that we will also use (not as main textbooks but we use their explanations) are:

- *Causal Inference: The Mixtape (2021)* by Scott Cunningham, Yale University Press
- *Mastering Metrics: The Path from Cause to Effect (2014)* by Joshua D. Angrist and Jörn-Steffen Pischke (Princeton University Press)
- *A Guide to Econometrics* by Peter Kennedy (Wiley-Blackwell)

It is important that you review the material we cover in class at home, including solving again all the exercises that we completed in class.

Requirements

Students taking this course should have already successfully completed the courses Statistics and Microeconomics.

Academic Integrity

Bard College Berlin maintains the highest standards of academic integrity and expects students to adhere to these standards at all times. Instances in which students fail to meet the expected standards of academic integrity will be dealt with under the Code of Student Conduct, Section 14.3 (Academic Misconduct) in the Student Handbook.

Accommodations

Bard College Berlin is committed to inclusion and providing equal access to all students; we uphold and maintain all aspects of Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and the ADA Amendments Act of 2008, and Section 3 of the German Disability Equality Act of April 27, 2002 (Federal Law Gazette I p. 1468). If you have a disability, or think you may have a disability, please contact the Disability Accommodation Coordinator, Atticus Kleen, (accommodations@berlin.bard.edu) to request an official accommodation.

Requests for accommodations should be made as early as possible to ensure adequate time for coordination and planning. Please note that accommodations are not retroactive and may require advance notice to implement.

If you have already been approved for accommodations with the Disability Accommodation Coordinator, please arrange to meet with me outside of class so that we can develop an implementation plan.

Students may face extenuating circumstances related to various personal or external factors, which impact their academic performance. While these circumstances often do not fall within the legal framework of Disability Accommodations, Bard College Berlin is committed to supporting students experiencing such circumstances. A student needing a short extension or a replacement assignment because of an extenuating circumstance is encouraged to make arrangements directly with instructors if possible. If further support is needed, please visit the [Bard College Berlin Accessibility page](#). Questions about this process can be directed to James Harker (j.harker@berlin.bard.edu) or Maria Anderson-Long (m.andersonlong@berlin.bard.edu).

Attendance

Attendance at all classes is a crucial part of the education offered by Bard College Berlin. To account for minor circumstances, two absences from twice-per-week courses or the equivalent (e.g. one absence from a once-per-week course) should not affect the participation grade or require documentation.

Bard College Berlin may not offer credit for any course in which a student has missed more than 30% of classes, regardless of the reasons for the absences. The full Bard College Berlin attendance policy can be found in the Student Handbook, Section 2.8.

Use of cell phones

The use of cell phones is not allowed during the classes. Please leave your cell phone in your bag during the classes.

Assessment

Assessment will be based on attendance, preparation for classes, regular and active participation, possible quizzes, handing in group problem sets, as well as a mid-term exam (60 minutes) or an equivalent empirical work. The course will be concluded with a final empirical work where students will have to apply what they have learned to answer a research question by analyzing data as they learned in the class.

Policy on Late Submission of Papers

Essays that are up to 24 hours late can be downgraded up to one full grade (from B+ to C+, for example). Instructors are not obliged to accept essays that are more than 24 hours late. Where a professor agrees to accept a late assignment, it should be submitted by the new deadline agreed upon by both parties. Thereafter, the student will receive a failing grade for the assignment. Grades and comments will be returned to students in a timely fashion. Students are also entitled to make an appointment to discuss essay assignments and feedback during instructors' office hours.

Students receive end-of-semester grades for their seminar work. Students are entitled to make an appointment with an instructor to discuss seminar participation, or may be asked to meet with the instructor at any stage in the semester regarding class progress.

Grade Breakdown

- Seminar participation, problem sets, and possible quizzes 30%
- Mid-term exam or an equivalent work 30% (the midterm exam will take place at around Week 10 – to allow for sufficient accumulation of material)
- Final empirical work 40% (20% presentations (including serving as discussants) 20% final written work). **Attendance in all final presentations is mandatory to pass the course**

Final empirical work

As part of the course each pair of students will conduct an independent (empirical) research project. The aim of the research project is to use field data to answer a well-defined research question. The research project requires the students to obtain and analyze a relevant data set (from an online source or to get the data, e.g., conduct a survey). The students will have to present their project in a workshop held in the final two weeks of the semester (**with a possible 3-hour session in completion week**). Finally, they will have to submit a short research paper.

Schedule

The following course structure is provisional in order to allow for flexibility. It is the students' responsibility to keep themselves informed of any changes to the schedule provided here. An up-to-date schedule will be maintained by the course management in our Google classroom system. Lecture slides and problem sets will be posted in Google classroom.

Fall 2025 semester runs from Monday, September 1 until Friday, December 19, with the Fall break planned from Monday, October 20, - Sunday, October 26, 2025. Normal course sessions end on Friday, December 12. Completion week is from Monday, December 15 through Friday, December 19.

- Make-up classes and final exams can take place in completion week.
- Students are required to be on campus during completion week.

Tentative course structure:

1. Introduction: causal inference, data, and the research process [1 week]
2. Repetition and extensions (Statistics): [2-3 weeks]
 - a. Review of probability
 - b. Review of statistics (including statistical tests)
3. The simple linear regression model [3 weeks including problem sets]
 - a. estimating the coefficients, least square assumptions, non-linear transformations, etc.
 - b. Applications using a statistical software
4. Modeling Issues [1 Week]
 - a. Prediction, rescaling, and non-linear transformation
5. Predictions, goodness of fit and modeling issues
6. The multiple linear regression model [3 Week including problem sets]
 - a. Estimation, goodness of fit, estimating joint tests, non-linearities
 - b. Using indicator variables, heteroskedasticity
 - c. Endogenous regressions and instrumental variables
7. Hypothesis testing [1 week]
 - a. Simple tests, tests of a linear combination of parameters,
8. Binary dependent variable models [1-2 week including problem sets]
9. Estimation issues: (e.g., Regression discontinuity, instrumental variables) [1 week]
10. Presentations of empirical work and dealing with the practicality of econometrics analysis. [1-1.5 week – possibly in completion week]

Classes missed due to federal holidays will not be rescheduled.

This version: June 30, 2025