Economics 480-1: Introduction to Econometrics (Fall 2021)

Economics 480-1 is the first third of the year-long introduction to econometrics for first-year Ph.D. students in economics. After 480, students may enroll in Economics 481 (econometric methods), Economics 482 (time-series analysis), and/or Economics 483 (applied microeconometrics). Prerequisites for 480-1 include undergraduate courses in probability and mathematical statistics with calculus emphasis. Grading is based on problem set assignments (10%), a midterm examination (40%), and a final examination (50%).


Instruction in this course seeks to promote academic freedom of expression, as discussed in the 2007 report of the AAUP on Freedom in the Classroom: https://www.aaup.org/AAUP/comm/rep/A/class.htm

Syllabus (with tentative lecture and exam schedule)

Introduction to Course (9/21)

Conditional Prediction (9/23, 9/28)
  IPD, Chapter 1

Prediction with Incomplete Data (9/30, 10/5, 10/7, 10/12)
  IPD, Chapters 2 through 5

Prediction of Treatment Response (10/14, 10/19, 10/21)
  IPD, Chapters 7 through 9

Planning under Ambiguity (10/28, 11/2, 11/4, 11/9, 11/11)
  IPD, Chapters 11 and 12

Predicting Choice Behavior (11/16, 11/18, 11/23, 11/30)
  IPD, Chapters 13 through 15

Midterm Examination: Tuesday October 26, in class

Final Examination: Thursday December 2, in class
480-1 Lectures, Sections, Problem Sets, and Exams (tentative detailed schedule)


Lecture 9/23: Conditional prediction, IPD 1.2 and 1A.

Section 9/24: NU computer facilities. Introduction to STATA, with application to linear regression.

Lecture 9/28: Kernel Estimation of Best Predictors, IPD 1.3 and 1B.
Post Problem Set 1.

Lecture 9/30: Missing Outcomes Using the Data Alone, IPD 2.1–2.4, 2.A; Statistical Inference 2.7, 2.C.

Section 10/1: application of nonparametric regression.

Lecture 10/5: Distributional Assumptions, IPD 2.5–2.6, Instrumental Variables, IPD 3.
Problem Set 1 due. Post Problem Set 2.

Lecture 10/7: Bounding the COVID-19 infection rate. (Manski and Molinari, 2021)

Section 10/8: Discuss Problem Set 1. Jointly Missing Outcomes and Covariates, IPD Complement 2B

Lecture 10/12: Decomposition of Mixtures, IPD 5.
Problem Set 2 due. Post Problem Set 3.

Lecture 10/14: The Selection Problem, IPD 7.1-7.4.


Lecture 10/19: IPD 7.5-7.7.
Problem Set 3 due.

Lecture 10/21: The Simultaneity Problem and Monotone Treatment Response, IPD 8 and 9


Midterm Exam 10/26: in class

Lecture 10/28: Planning under Ambiguity, IPD 11.1–11.3.

Section 10/29: Discuss Midterm Exam.

Lecture 11/2: Planning under Ambiguity, IPD 11.4–11.8 and 11A.
Post Problem Set 4.


Section 11/5: Bayesian Statistical Decision Theory

Lecture 11/9: Treatment Choice with Data from a Randomized Experiment, IPD 12.3.
Problem set 4 due. Post Problem set 5.


Section 11/12: Discuss Problem set 4.

Lecture 11/16: Revealed Preference Analysis, IPD 13.1 and 13B.


Section 11/19: Discuss Problem set 5. Prediction Assuming Strict Preferences, IPD 13A.

Problem Set 6 due.


Section to be scheduled: Discuss Problem Set 6. Review for exam.

Final Exam: 12/2 in class

Recording by the Instructor: This class or portions of this class may be recorded by the instructor for educational purposes. Any recordings will be shared only with students enrolled in the course in Canvas and will be deleted at the end of the quarter. Note that this applies to recording of synchronous class components and not to pre-recorded lectures by the instructor and not featuring student contributions.

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