Economics 480-1: Introduction to Econometrics (Fall 2022)

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 (9/20)

Conditional Prediction (9/22, 9/27)  
IPD, Chapter 1

Prediction with Incomplete Data (9/29, 10/4, 10/6, 10/11)  
IPD, Chapters 2 through 5

Prediction of Treatment Response (10/13, 10/18, 10/20)  
IPD, Chapters 7 through 9

Planning under Ambiguity (10/27, 11/1, 11/3, 11/8, 11/10)  
IPD, Chapters 11 and 12

Predicting Choice Behavior (11/15, 11/17, 11/22, 11/29)  
IPD, Chapters 13 through 15

Midterm Examination: Tuesday October 25, in class

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

Lecture 9/20: IPD Introduction.

Lecture 9/22: Conditional prediction, IPD 1.2 and 1A.

Section 9/23: NU computer facilities. Introduction to STATA, with application to linear regression.

Lecture 9/27: Kernel Estimation of Best Predictors, IPD 1.3 and 1B.
Post Problem Set 1.

Lecture 9/29: Missing Outcomes Using the Data Alone, IPD 2.1–2.4, 2.A; Statistical Inference 2.7, 2.C.

Section 9/30: application of nonparametric regression.

Lecture 10/4: Distributional Assumptions, IPD 2.5–2.6, Instrumental Variables, IPD 3.
Problem Set 1 due. Post Problem Set 2.

Lecture 10/6: Bounding the COVID-19 infection rate. (Manski and Molinari, 2021)

Section 10/7: Discuss Problem Set 1. Jointly Missing Outcomes and Covariates, IPD Complement 2B

Lecture 10/11: Decomposition of Mixtures, IPD 5.
Problem Set 2 due.

Post Problem Set 3.


Lecture 10/18: IPD 7.5-7.7.

Lecture 10/20: The Simultaneity Problem and Monotone Treatment Response, IPD 8 and 9
Problem Set 3 due.

Section 10/21: Discuss Problem Set 3. Review for exam.

Midterm Exam 10/25: in class

Lecture 11/1: Planning under Ambiguity, IPD 11.1–11.3.

Section 10/28: Discuss Midterm Exam.


Section 11/4: Bayesian Statistical Decision Theory
Lecture 11/8: Treatment Choice with Data from a Randomized Experiment, IPD 12.3. Problem set 4 due. Post Problem set 5.


Section 11/11: Discuss Problem set 4.


Section 11/18: Discuss Problem set 5. Prediction Assuming Strict Preferences, IPD 13A.


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

Final Exam: 12/1 in class