

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%).

Text: C. Manski, *Identification for Prediction and Decision* (IPD), Harvard University Press, 2007.

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 9/21: IPD Introduction.

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.

Section 10/15: Discuss Problem Set 2. Parametric Prediction, IPD 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

Section 10/22: Discuss Problem Set 3. Review for exam.

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.

Lecture 11/4: Introduction to Statistical Decision Theory, IPD 12.1 and 12.2.

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.

Lecture 11/11: Statistical Decision Properties of Trials Assessing COVID-19 Drugs (Manski and Tetenov, 2021).

Section 11/12: Discuss Problem set 4.

Lecture 11/16: Revealed Preference Analysis, IPD 13.1 and 13B.
Problem set 5 due. Post Problem Set 6.

Lecture 11/18: Revealed Preference Analysis, IPD 13.2 and 13.3.

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

Lecture 11/23: Revealed Preference Analysis, IPD 13.4.
Problem Set 6 due.

Lecture 11/30: Measurement of Expectations, IPD 14.

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

Final Exam: 12/2 in class

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