

**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%).

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 (9/20)

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.

Lecture 10/13: The Selection Problem, IPD 7.1-7.4.  
Post Problem Set 3.

Section 10/14: Discuss Problem Set 2. Parametric Prediction, IPD 4.

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 10/27: Planning under Ambiguity, IPD 11.1–11.3.

Section 10/28: Discuss Midterm Exam.

Lecture 11/1: Planning under Ambiguity, IPD 11.4–11.8 and 11A.  
Post Problem Set 4.

Lecture 11/3: Introduction to Statistical Decision Theory, IPD 12.1 and 12.2.

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.

Lecture 11/10: Statistical Decision Properties of Trials Assessing COVID-19 Drugs (Manski and Tetenov, 2021).

Section 11/11: Discuss Problem set 4.

Lecture 11/15: Revealed Preference Analysis, IPD 13.1 and 13B.  
Problem set 5 due. Post Problem Set 6.

Lecture 11/17: Revealed Preference Analysis, IPD 13.2 and 13.3.

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

Lecture 11/22: Revealed Preference Analysis, IPD 13.4.  
Problem Set 6 due.

Lecture 11/29: Measurement of Expectations, IPD 14.

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

Final Exam: 12/1 in class

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