

**Economics 480-1: Introduction to Econometrics (Fall 2017)**

Economics 480-1 is the first third of the year-long introduction to econometrics for first-year Ph.D. students in economics. After completion of 480, students may wish to enroll in components of Economics 481, a set of courses in econometric methods; Economics 482, a course in time-series methods; and/or Economics 483, a course in 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.  
(Purchase at bookstore or order online at [www.amazon.com](http://www.amazon.com).)

**Syllabus** (tentative schedule)

Introduction to Course (9/19)

Conditional Prediction (9/21, 9/26)  
IPD, Chapter 1

Prediction with Incomplete Data (9/28, 10/3, 10/5, 10/10)  
IPD, Chapters 2 through 5

Prediction of Treatment Response (10/12, 10/17, 10/19)  
IPD, Chapters 7 through 9

Planning under Ambiguity (10/26, 10/31, 11/2, 11/7, 11/9)  
IPD, Chapters 11 and 12

Predicting Choice Behavior (11/14, 11/16, 11/21, 11/28)  
IPD, Chapters 13 through 15

Midterm Examination: Tuesday October 24, in class

Final Examination: Thursday November 30, in class

480-1 Lectures, Sections, Problem Sets, and Exams (tentative schedule)

Lecture 9/19: IPD Introduction.

Lecture 9/21: Conditional prediction, IPD 1.2 and 1A.

Section 9/22: NU computer facilities. Introduction to STATA, with application to linear regression.

Lecture 9/26: Kernel Estimation of Best Predictors, IPD 1.3 and 1B.  
Post Problem Set 1.

Lecture 9/28: Missing Outcomes Using the Data Alone, IPD 2.1–2.4, 2.A; Statistical Inference 2.7, 2.C.

Section 9/29: Proof of consistency of the uniform kernel estimate.

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

Lecture 10/5: Parametric Prediction, IPD 4.

Section 10/6: Discuss Problem Set 1. Jointly Missing Outcomes and Covariates, IPD Complement 2B.

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

Lecture 10/12: The Selection Problem, IPD 7.1-7.4.  
Post Problem Set 3.

Section 10/13: Discuss Problem Set 2. Perspectives on Treatment Comparison, IPD Complement 7A.

Lecture 10/17: IPD 7.5-7.7.

Lecture 10/19: The Simultaneity Problem and Monotone Treatment Response, IPD 8 and 9  
Problem Set 3 due.

Section 10/20: Discuss Problem Set 3. Review for midterm exam.

Midterm Exam: 10/24 in class (90 minutes)

Lecture 10/26: Planning under Ambiguity, IPD 11.1 and 11.2.

Section 10/27: Discuss Midterm Exam. IPD 11.3.

Lecture 10/31: Planning under Ambiguity, IPD 11.4–11.8 and 11A.  
Post Problem Set 4.

Lecture 11/2: Introduction to Statistical Decision Theory, IPD 12.1 and 12.2.

Section 11/3: Bayesian Statistical Decision Theory, Notes on Bayesian Inference and Bayes Decisions.

Lecture 11/7: Treatment Choice with Data from a Randomized Experiment, IPD 12.3.  
Problem set 4 due.

Lecture 11/9: RCT Design as a Statistical Decision Problem; Manski and Tetenov, *PNAS*.

Section 11/10: Discuss Problem Set 4.

Lecture 11/14: Revealed Preference Analysis, IPD 13.1 and 13B.

Lecture 11/16: Revealed Preference Analysis, IPD 13.2 and 13.3.  
Post Problem Set 5.

Section 11/17: Discuss Problem Set 5. Prediction Assuming Strict Preferences, IPD 13A.

Lecture 11/21: Revealed Preference Analysis, IPD 13.4.  
Problem Set 5 due.

Lecture 11/28: Measuring Expectations, IPD 13.4 and Chapter 14

Section 11/28 or 11/29 (date and time to be determined): Discuss Problem Set 6. Review for final exam.

Final Exam: 11/30 in class (90 minutes)