

Economics 480-1: Introduction to Econometrics (Fall 2020)

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. (Purchase Norris Bookstore or at Amazon www.amazon.com.)

Syllabus (with tentative lecture and exam schedule)

Introduction to Course (9/17)

Conditional Prediction (9/22, 9/24)
IPD, Chapter 1

Prediction with Incomplete Data (9/29, 10/1, 10/6, 10/8)
IPD, Chapters 2 through 5

Prediction of Treatment Response (10/13, 10/15, 10/20)
IPD, Chapters 7 through 9

Planning under Ambiguity (10/27, 10/29, 11/3, 11/5, 11/10)
IPD, Chapters 11 and 12

Predicting Choice Behavior (11/12, 11/17, 11/19, 11/24)
IPD, Chapters 13 through 15

Midterm Examination: Thursday October 22, in class

Final Examination: Tuesday December 1, in class

Recording by the Instructor: This class or portions of this class will be recorded by the instructor for educational purposes. These 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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480-1 Lectures, Sections, Problem Sets, and Exams (tentative detailed schedule)

Lecture 9/17: IPD Introduction.

Section 9/18: NU computer facilities. Introduction to STATA, with application to linear regression.

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

Lecture 9/24: Kernel Estimation of Best Predictors, IPD 1.3 and 1B.

Section 9/25: application of nonparametric regression.

Lecture 9/29: Missing Outcomes Using the Data Alone, IPD 2.1–2.4, 2.A; Statistical Inference 2.7, 2.C.
Problem Set 1 due. Post Problem Set 2.

Lecture 10/1: Distributional Assumptions, IPD 2.5–2.6, Instrumental Variables, IPD 3.

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

Lecture 10/6: Parametric Prediction, IPD 4.
Problem Set 2 due.

Lecture 10/8: Decomposition of Mixtures, IPD 5.

Section 10/9: Discuss Problem Set 2.

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

Lecture 10/15: IPD 7.5-7.7.

Section 10/16: applied analysis of treatment response.

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

Section 10/21 (to be scheduled). Problem Set 3. Review for exam.

Midterm Exam 10/22: in class

Lecture 10/27: Planning under Ambiguity, IPD 11.1–11.3.
Post Problem Set 4.

Lecture 10/29: Planning under Ambiguity, IPD 11.4–11.8 and 11A.

Section 10/30: Discuss Midterm Exam.

Lecture 11/3: More on Planning under Ambiguity.
Problem set 4 due.

Lecture 11/5: Introduction to Statistical Decision Theory, IPD 12.1 and 12.2.

Section 11/6: Discuss Problem Set 4. Bayesian Statistical Decision Theory

Lecture 11/10: Treatment Choice with Data from a Randomized Experiment, IPD 12.3.

Lecture 11/12: Revealed Preference Analysis, IPD 13.1 and 13B.

Section 11/13: application of statistical decision theory to RCTs

Lecture 11/17: Revealed Preference Analysis, IPD 13.2 and 13.3.
Post Problem Set 5.

Lecture 11/19: Revealed Preference Analysis, IPD 13.4.

Section 11/20: Prediction Assuming Strict Preferences, IPD 13A.

Lecture 11/24: Measurement of Expectations, IPD 14.
Problem Set 5 due.

Section to be scheduled: Problem set 5. Review for exam.

Final Exam: 12/1 in class