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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

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