Stanford University **Fall Quarter 2025**
Graduate School of Business **MGTECON 603**
Department of Economics **ECON 270**

Econometrics I

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Office Hours:	By appointment
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Office Hours:	Thursdays 11:30am-1:30pm, Landau 149
Section:	Fridays 1:30-3:20pm, location TBD

Course Description.

Lectures. Each week, there will be two in-person meetings, Monday and Wednesday 1:30-3:20pm, starting on Monday, September 22, in GSB McClelland 105. Lecture notes, slides, some selected papers, and sometimes recordings of the lectures will be posted on the course website 48 hours prior to class.

There will be two sets of required assignments. First, each student will be assigned 4 lectures. At most 24 hours after each of your assigned lectures, you must submit a question. This post-class question can be related to the slides (which will be posted ahead of time), the readings, or what was covered during the lecture itself. The goal of these post-class questions is to adjust section materials to address your areas of concern and/or interest. Students will be assigned to lectures beginning with the second lecture on Wednesday, September 24.

In addition to the submitted questions, there will be regular computational and theoretical exercises that you can do in self-selected study groups of 3 to 4 people, with the groups fixed for the entire course. If you have problems finding students with whom to form a study group, then email Guido and Sarah and we will assign you to a group. You can use any programming language or package; this may play a role in your study group selection. Solution sets will be written in Matlab.

Grades will be calculated as follows: Post-class questions will count for 10%; problem sets, 30%, with points distributed equally across all exercises in each set; the midterm exam, 30%; and the final exam, 30%.

Guido will be traveling on Wednesday, October 29, so there will be no class. There will be a make-up class, tentatively on Friday, November 7, time and location to be determined.

Books. There will be one textbook that will be used as a reference book and for additional material: Angrist, J., and S. Pischke (2008), *Mostly Harmless Econometrics*, Princeton University Press. Additionally, there will be a number of journal articles used as background. These are not essential for following the lectures, but are useful for a deeper understanding of the material. Most of these articles are available electronically.

Exams. There will be an in-class midterm exam on Monday, October 27. There will also be an in-person final exam on Wednesday, December 10, 3:30-6:30pm, location to be determined.

Course Outline.

1. Randomized Experiments and Estimating Causal Effects
   (a) (Monday 9/22) Probability, Statistics, and Econometrics: Objectives and Differences
   (b) (Wednesday 9/24) Randomization and Fisher's Exact P-Values
   (c) (Monday 9/29) Estimating Average Treatment Effects in Randomized Experiments
   (d) (Wednesday 10/1) A Least Squares Regression Approach to Randomized Experiments
   (e) (Monday 10/6) Variance Estimation Using Resampling
   (f) (Wednesday 10/8) Randomized Experiments with Pretreatment Variables
2. Linear Regression
   (a) (Monday 10/13) Prediction and Least Squares Regression with a Single Regressor
   (b) (Wednesday 10/15) Mechanics of Least Squares Regression with Multiple Regressors
   (c) (Monday 10/20) Omitted Variable Bias
   (d) (Wednesday 10/22) In-sample and Out-of-sample Fit
   (e) (Monday 10/27) In-Class Midterm Exam
   (f) (Wednesday 10/29) No class, to be rescheduled
   (g) (Monday 11/3) Regularization
   (h) (Wednesday 11/5) Clustering and Regression
3. Maximum Likelihood Methods and Bayes
   (a) (TENTATIVE, rescheduled class from 10/29) (Friday 11/7) Maximum Likelihood Estimation
   (b) (Monday 11/10) Properties of Maximum Likelihood Estimators
   (c) (Wednesday 11/12) Bayesian Inference and Statistical Decision Theory
   (d) (Monday 11/17) Bayesian Methods and Markov Chain Monte Carlo Methods

4. Unconfoundedness and Matching Type Methods
   (a) (Wednesday 11/19) Regression Methods and Inverse Propensity Score Weighting Methods
   (b) (Monday 12/1) Doubly Robust Methods
5. Instrumental Variables
   (a) (Wednesday 12/3) Linear Instrumental Variable Methods with Constant Coefficients

Last revised on September 21, 2025.