

Metrics Bootcamp Syllabus
Stanford GSB
Summer 2021: August 9 - August 12, 2-3pm
Location: GSB C102 ([map](#))
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The goal of this bootcamp is to get you comfortable with econometrics at the level that will be required in your research activities at Stanford as a research fellow.

It will also give you the chance to get comfortable applying these concepts and completing related tasks in R in your own time. If you don't know R and/or don't want to invest in it for this bootcamp that is fine, but it will be helpful to do some of the exercises in some programming language. My understanding is that R and Stata will be the most popular languages that faculty use, but they may also use Python or Matlab. I personally think R is a good language because it can do almost everything that the other statistical softwares can do and it is free and super easy to install and edit code through RStudio.

The topics that I plan to cover are listed below by day. Feel free to let me know if you would like to add something else. There are only 4 scheduled days for about an hour so we won't be able to cover too much in detail during the lectures, but there is quite a bit of extra HW and resource references that should help you understand the material better if you want to spend some of your own time learning. If there is enough demand, I could also hold a few extra office hours or other sessions to go over extra concepts. I'm also always happy to direct you to further references and give advice on courses, etc.

Schedule Plan

Day 1

Intro and Statistics and Linear Algebra for Metrics

- Quick Intro to Metrics
- Quick Intro to Stats for Metrics
 - Random variables
 - Expectation, covariance, conditional expectation
- Quick Intro to Linear Algebra for Metrics
 - Matrices and vectors
 - Matrix multiplication and transposes
 - Linear independence, rank and inverses

Day 2

Basic OLS

- Regression Intro
- OLS derivation
- Assumptions and statistical properties

- Endogeneity

Day 3

Advanced Topics I

- IV
- Panel Data

Day 4

Advanced Topics II

- Basic Structural Modeling
- MoM and GMM
- (If time) Basic Machine Learning in Economics
- Stanford/Grad School Questions