



Hello and welcome to Introduction to Econometrics: ECON 418-518! My name is Will Brasic, and I will be your instructor for this course. I am a third-year doctoral student at The University of Arizona, with research interests in industrial organization, machine learning, and applied econometrics. Currently, I am investigating the dynamics of algorithmic pricing and its impact on competition using deep reinforcement learning.

This course will provide you with a comprehensive introduction to econometrics, a crucial tool for identifying causal effects. We will start by understanding the basics of econometrics and reviewing the essential mathematical concepts necessary for success in this course. Following this, we will delve into the fundamental building blocks of econometrics, focusing on simple and multiple linear regression using ordinary least squares. We will explore the assumptions underlying the linear model, discuss the consequences of violating these assumptions, and learn techniques to address these issues. Additionally, we will go beyond linear regression to cover more advanced econometric estimators.

In the final third of the course, we will transition to machine learning, a rapidly evolving field that is increasingly influencing econometrics and economics as a whole. We will begin by understanding the core principles and comparing them to traditional econometrics. The remainder of the course will be dedicated to learning some of the most prominent machine learning algorithms.

Moreover, you will gain proficiency in R, a powerful language and environment for statistical computing and graphics. R is widely used by economists and statisticians, and developing expertise in it will be a valuable asset for your resume and career prospects. I strongly encourage you to invest time in mastering R.

My goal is for this course to be one of the most valuable experiences of your undergraduate career. Employers are keen to hire graduates who possess the following skills: (1) coding proficiency, (2) the ability to understand and apply econometric tools to solve real-world problems, and (3) the capability to use various machine learning algorithms to create highly predictive models. By the end of this course, you will be equipped to meet all three of these criteria.

Thank you for joining this class, and I look forward to working with you throughout the semester!