

## Table of Contents

- 1. Course Information ..... 2
- 2. Course Description, Goals, and Expectations ..... 2
  - 2.1 Aims..... 2
  - 2.2 Learning Outcomes ..... 3
  - 2.3 Requirements for Students ..... 3
    - Before the semester starts ..... 3
    - After the semester starts ..... 4
  - 2.4 Course Website and Contents ..... 4
  - 2.5 Course Readings ..... 4
  - 2.6 Exams and Grading ..... 5
    - Exams ..... 5
    - Grading..... 5
  - 2.7 Important Dates ..... 6
- 3. Course Related Policies ..... 7
  - 3.1 Academic Integrity ..... 7
  - 3.2 Honor Pledge..... 7
  - 3.3 CourseEvalUM..... 7
  - 3.4 Absences and Other Matters ..... 7
  - 3.5 Basic Needs Security ..... 8

## 1. Course Information

<b>Instructor:</b>	Erich Battistin <a href="https://erichbattistin.weebly.com/">https://erichbattistin.weebly.com/</a> Room 2212, Symons Hall ebattist@umd.edu
<b>Office Hours:</b>	Wed 1:00pm – 2:30pm (by appointment only)
<b>TA:</b>	Ao Yu - ayu358@umd.edu
<b>Lectures:</b>	Tue & Thu 11:00am – 1:30pm (SYM 0209 first class, then SYM 3121)
<b>Discussion:</b>	Fri 3:00pm – 5:00pm (KEY 0123, taught by the course TA)

## 2. Course Description, Goals, and Expectations

### 2.1 Aims

I offer a modern introduction to empirical strategies in applied micro research in fields such as public policy, development economics, labor economics, education, marketing, and corporate finance. Geared towards first-year Ph.D. students familiar with introductory statistics or econometrics, this course focuses on causal reasoning and design-driven identification in the social sciences, offering practical insights and techniques for real-world applications. Throughout our journey, I will emphasize intuition over extensive formal derivation of theoretical aspects of probability and statistics, focusing instead on the essential foundations for assessing causal relationships. We will explore a range of methods to address causal questions effectively. Our exploration begins with approximating the conditional expectation function using a linear predictor, employing Ordinary Least Squares (OLS). We will delve into the implications of omitted variables and examine the value of research designs that replicate the outcomes of randomized experiments, such as Instrumental Variables (IV) and other quasi-experimental methods. Additionally, we will delve into sampling theory, understanding the differences between design-based and sampling-based uncertainty. Time permitting, we will also explore extensions to high-dimensional, big-data contexts. All concepts will be brought to life with practical applications on real data using Stata.

## 2.2 Learning Outcomes

Upon completing this course, students will acquire the essential skills to conduct a critical assessment of various empirical strategies suited for applied micro research questions. The topics covered will serve as a comprehensive toolkit, enabling students to undertake independent Ph.D. research with a reasonable level of technical proficiency. Furthermore, students will gain the ability to understand the econometric methods commonly employed in social science empirical studies. An integral aspect of this course is hands-on experience with Stata, a widely used statistical software. Through practical exercises, students will become adept at employing Stata for data analysis, bolstering their ability to communicate empirical findings effectively. Notably, students will develop the capacity to present their empirical results in ways that are both illuminating and persuasive, while upholding rigorous standards of analysis. The emphasis on effective communication will be paramount, ensuring that research outcomes are conveyed with clarity and precision. By the course's conclusion, students will possess a strong foundation in applied micro research methods, allowing them to engage confidently in their Ph.D. journey and contribute meaningfully to the field of study. The materials covered set the stage for further training in causal inference, as in [AREC829](#) (which is the natural continuation of this course).

## 2.3 Requirements for Students

Before the semester starts. **Students are expected to be comfortable with college-level algebra and calculus.** Although we will develop together the main concepts of statistical inference and probability, a **lack of any introductory statistics and probability background may make this course more difficult than necessary.** You are therefore asked to acquire a **good working knowledge** of basic mathematical tools, fundamentals of probability, fundamentals of mathematical statistics and matrix algebra **before the beginning of classes.** A general discussion on these topics can be found, for example, in Appendix A, B, C and D in: Jeffrey M. Wooldridge (2016), "[Introductory Econometrics: A Modern Approach \(6th Edition\)](#)", Cengage. You are also warmly encouraged to look at past exams and problem sets to familiarize yourself with learning outcomes and expectations for this course.

After the semester starts. I encourage you to spend time reading course materials and lecture slides **before coming to class**. You will internalize the concepts much more clearly if you spend time struggling with the material before class starts. You are also encouraged to familiarize yourself with Stata throughout the course. Help for new Stata users will be given in discussion classes, but these **classes are not aimed at developing coding skills**. Most of the Stata commands used in classes are discussed, for example, in Colin Cameron, and Pravin K. Trivedi (2010), “[Microeconometrics Using Stata - Revised Edition](#)”, Stata Press. However, many introductory manuals to Stata are available on the web. **You should expect only one introductory class to Stata in this course.**

## 2.4 Course Website and Contents

Lecture slides, course program and reading materials are available on the course [website](#). Each block of slides will be made available approximately one week before being used in lectures. Reading materials can be accessed through the UMD library network. Problem sets will be available through Canvas, where you will also find solutions to past problem sets and exams as well. Stata codes, data and materials for the discussion sections will be available through Canvas.

## 2.5 Course Readings

I will mix traditional approaches to micro-econometrics with more modern tools used in several empirical literatures. For this reason, **it is impossible to identify one textbook**, and **readings are primarily articles and working papers listed on the course website**. Lecture slides are self-contained and may be enough to understand the topics discussed. However, **you are strongly invited not to limit your study to the slides, and it is in your interest to familiarize yourself with the additional readings suggested in the course website and during lectures**. Although we are not going to follow one textbook, our reasoning will follow selected chapters of the following manuals, which you may find useful in the remainder of your Ph.D. as well.

- Joshua D. Angrist, and Jorn-Steffen Pischke (2009). “[Mostly Harmless Econometrics. An Empiricist’s Companion](#)”, Princeton University Press.
- Jeffrey M Wooldridge (2010). “[Econometric Analysis of Cross Section and Panel Data \(2nd Edition\)](#)”, MIT Press.

- Andrew Gelman, Jennifer Hill, and Aki Vehtari (2020). “[Regression and Other Stories](#)”, Cambridge University Press.

**Many other popular manuals and on-line resources can be used as well.**

## 2.6 Exams and Grading

**Exams.** Your final grade will be computed as a weighted average of three components:

- A mandatory midterm (40% of the final grade).
- A final during exam week (40% of the final grade).
- 4 problem sets (20% of the final grade).

**Please see examples of past exams and problem sets to understand what you should expect.**

Exams may include questions with an analytical component, or problems based on the output of statistical software to test your ability to understand and interpret numbers. Problem sets may ask you to replicate the empirical analysis in published papers. Some problem sets may require group work and presentations in groups that will be formed at random. **There isn't a fixed format for my problem sets or exams: these materials vary every year depending on how our discussion unfolds, the class intake and your own taste about what I teach.** Your answers to problem sets must be prepared in Latex, printed, and handed over to me or the TA at the beginning of the class when solutions are due. You are strongly encouraged to work together on the problem sets, but each student should turn in their own answers to these problems. All solutions to problem sets must be submitted on time to receive credit. If a problem set is not turned in or not turned in on time, it will be graded as zero. I will publish solutions to all problem sets soon after each deadline. All deadlines will be communicated in class.

**Grading.** I grade exams question by question, rather than exam by exam. I have a checklist of items to look for in your answers. I make this checklist explicit in my solutions. You should be able to grade your exam by looking at the solutions. I read answers to each question twice. The first time I read through everyone's answer to get a sense for the overall quality. For example, at times the tools required for solutions are not mastered well because I have not asked my questions well enough. I want to take this into account by reading all solutions first. The second time, I grade

using the checklist. I start with what I think was the best answer after my first reading and read through all exams. I do this to make sure that I appropriately differentiated quality in the first round. Once all answers are graded, I read your exam again and look for the overall control you have over the subject matter for each question. At the end of this process, I assign grades following the UMD's official marking system. The standards for letter grades are as follows:

- A+, A, A- denote excellent mastery of the subject and outstanding scholarship.
- B+, B, B- denote good mastery of the subject and good scholarship.
- C+, C, C- denote acceptable mastery of the subject.
- D+, D, D- denote borderline understanding of the subject, marginal performance, and it does not represent satisfactory progress toward a degree.
- F denotes failure to understand the subject and unsatisfactory performance.

My assignments and exams are graded on a point scale (e.g., out of 30). I use the following scale to relate percentage scores to letter grades:

- A+ 100%-98%.
- A 97%-94%.
- A- 93%-90%.
- B+ 89%-85%.
- B 84%-80%.
- B- 79%-75%.
- F 74% or below.

## 2.7 Important Dates

First class: August 29, 2023.

Last class: December 7, 2023.

No class on: November 23, 2023

Midterm exam: October 19, 2023.

Problem sets: you should expect 2 sets before and after the midterm, with deadlines defined depending on how the discussion in lectures unfolds.

### 3. Course Related Policies

#### 3.1 Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <https://studentconduct.umd.edu/>.

#### 3.2 Honor Pledge

To promote academic honesty on campus, you will be asked by your course instructors to write by hand and sign the following pledge on every examination, paper or other academic exercise. Writing this pledge will serve as a reminder of your commitment to academic integrity.

*“I pledge on my honor that I have not given or received any unauthorized assistance on this examination.”*

#### 3.3 CourseEvalUM

Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process. You can go directly to the website ([www.courseevalum.umd.edu](http://www.courseevalum.umd.edu)) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing the summary reports for thousands of courses online at Testudo.

#### 3.4 Absences and Other Matters

The University policy regarding attendance and other matters can be found at <http://www.ugst.umd.edu/courselatedpolicies.html>. Briefly, the University states that “*For*

*medically necessitated absences: Students may, one time per course per semester, provide a self-signed excuse as documentation of an absence from a single class (e.g., lecture, recitation, or laboratory session) that does not coincide with a major assessment or assignment due date. For all other medically necessitated absences, a course instructor may request that students provide documentation from a physician or the University Health Center to verify an absence. In cases where students are asked to provide verification, the course instructor may request the dates of treatment or the time frame that the student was unable to meet academic responsibilities, but may not request diagnostic information”.* Under the policy, the University will accept as an excused absence a self-signed note from a student who has missed a single lecture, recitation, or laboratory, attesting to the date of the illness. The note must also contain an acknowledgement by the student that the information is true and correct and that providing false information is prohibited under Code of Student Conduct. The student is also obligated to make a reasonable attempt to inform the instructor of his/her illness in advance. Note that this policy does not apply to the Major Scheduled Grading Events. A student who experiences a prolonged absence or an illness preventing attendance at a major Scheduled Grading Event is required to provide written documentation of the illness from the Health Center or an outside health care provider, verifying the dates of treatment and the time period during which the student was unable to meet academic responsibilities. For this course, medically necessitated absences from more than a single lecture, recitation, or laboratory will be excused but the student will be responsible for making up any missed quizzes or exams and should consult other students regarding the missed material. Makeup quizzes will not cover the same material and makeup exams may cover different material and may be administered in oral form.

### 3.5 Basic Needs Security

If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live and believe this may affect your performance in this course, please visit <http://go.umd.edu/basic-needs> for information about resources the campus offers you and let me know if I can help in any way.