Master of Science in Applied Economics
University of Maryland, College Park

Econ 643: Fall 2025

1.1 Instructors and Classes

Instructor Name:	Christian Krestel
Instructor email:	ckrestel@umd.edu
Class Meetings:	**Monday 11:00 am-1:45 pm, with a 15-minute break around 12:15 pm**
Location:	**H.J. Patterson Hall** **Room Number: 2242** https://www.google.com/maps/place/H.J.+Patterson+Hall/@38.9870071,-76.9439288,16z/data=!3m1!4b1!4m6!3m5!1s0x89b7c697bd70ee79:0xd9edae475e4f7de0!8m2!3d38.9870071!4d-76.9439288!16s%2Fg%2F11gdxkt36m?entry=ttu&g_ep=EgoyMDI1MDgxOS4wIKXMDSoASAFQAw%3D%3D
Office Hours:	Tuesday 1:30 pm-2.30 pm, Zoom (see ELMS), and by appointment
TA Name:	Nicolas Berlinsky
TA email:	nberlins@umd.edu
TA Office hours:	TBA (see announcements and ELMS section pages for the link and location)

Fall break: Oct 13 – 14

1.2 Communication

The primary means of communication is email. Emails will be sent to @umd.edu addresses. You are responsible for regularly checking your @umd.edu address, including announcements made via ELMS/Canvas. Please note that problems with your mailbox do not excuse missed deadlines or announcements.

I will try to answer your emails as quickly as possible. You are, however, also welcome to attend my office hour (via Zoom). You'll find the link on ELMS/pages. Please send me an email before informing me that you want to attend!

1.3 Exams

Midterm: 10/27
Final: 12/15

1.4 Overview

Fundamental aspects of data management and statistics. Emphasis on practical application rather than theory. Emphasis on sampling, basic probability theory, basic statistics, an introduction to regression, and an introduction to STATA. The course includes an empirical replication project, which introduces students to the application of statistics and econometrics in published academic research. ECON 643 is the first course in our program's 3-course Empirical Analysis sequence. ECON 643 is the prerequisite for ECON 644, which is the prerequisite for ECON 645.

Course Website: Copies of the course syllabus, your grades, and other relevant links and documents will be posted on the course's ELMS/Canvas website. You can access the site via www.elms.umd.edu. You will need to use your University of Maryland "directory ID" and password.

1.5 Learning Objectives

Our program has 7 general learning outcomes for students:

1. Ability to understand, evaluate, and analyze economic data
2: Ability to understand and interpret statistical evidence from economic data
3: Ability to apply empirical evidence to assess economic arguments
4: Ability to apply macroeconomic theories to policy discussions
5: Ability to apply microeconomic theories to policy discussions
6: Ability to communicate economic ideas to a broader audience
7: Ability to evaluate the effectiveness of policy programs using sound economic techniques

The learning outcomes that pertain to this course are 1,2,3,5,6, and 7.

1.6 Textbooks

The following textbooks are required:
Sfbe: Statistics for Business and Economics by Anderson, Sweeney, Williams, Camm and Cochrane, Cengage, 13th or later edition
Agis: A Gentle Introduction to Stata by Acock (Stata Press), 5th or later ed.
Mit: Data Management Using Stata: A Practical Handbook, Michael N. Mitchell, 1st edition or later

Some additional readings will also be provided via the course's ELMS/Canvas website.

Additional (but optional) textbooks:
(a) Probability:
Probability and Statistics for Economists, Hansen, Bruce E., Princeton University Press, 1st edition
Statistical Inference, Cassella, George and Berger, Robert L., Cengage, 2nd edition or newer
Probability with Martingales, Williams, David, Cambridge Mathematical Textbooks
A First Course in Probability, Ross, Sheldon, Pearson, 8th edition or later
(b) Stata:
Using Stata for Principles of Econometrics, Adkins, Lee C., and Hill, Carter, John Wiley, 5th edition or later

1.7 Required software

Required Statistical Software: STATA, version 15 or 16.

There are two ways for students to access Stata:

1. **Accessing Stata via the UMD Virtual Workspace:** UMD students have access to a Windows virtual desktop with university-approved software applications, including Stata SE. Keep in mind that it does have limitations, such as limited temporary storage space (although you can open and save files from cloud-based storage services like Box and Google) and an automatic disconnect after 15 minutes of inactivity. For more information and access instructions, visit: https://itsupport.umd.edu/itsupport?id=kb_article_view&sysparm_article=KB0015413

2. **Purchasing Stata:** Stata offers various editions and license lengths. Stata/BE is the least expensive and most suitable edition for your coursework, but you can explore all the options here: https://www.stata.com/products/which-stata-is-right-for-me/. You can install it on your personal computer and do not need to use a virtual environment. There are discounted prices for students if you purchase through this link: https://www.stata.com/order/new/edu/profplus/student-pricing/. Prices depend on the length of license purchased: a 6-month license ($48 for Stata/BE), an annual license ($94 for Stata/BE), or a perpetual license ($225 for Stata/BE). The perpetual license does not expire. During the checkout process, you will be asked to verify your "@umd.edu" email address.

Other Software: A latex distribution such as Miktex (https://miktex.org) or tinytex (https://yihui.org/tinytex/) - both free. A WYSIWYG latex editor such as Lyx (https://www.lyx.org) and a tex editor such as TeXStudio (https://www.texstudio.org) – both free. On MacOS the program texifier is useful (paid).

Laptop Computer Requirement: Completing some of this course's requirements will require a laptop computer (not a notebook or a tablet!) with at least 1 GB of RAM and at least 5 GB of free space available on the hard drive. We recommend laptops with at least a 15-inch screen. Screens smaller than 13 inches are probably not practical.

1.8 Course Outline (changes, if any, will be announced in class and via ELMS)

Week	Date	Topic
1	Sept 08	Meet each other and an introduction to the course TA presentation on how to use ELMS and submit to ELMS Discussion of the course project and the course project proposal Sfbe Ch1: Data and Statistics Ch2: Descriptive Statistics: Tabular and Graphical Displays
2	Sept 15	Sfbe Ch3: Descriptive Statistics: Numerical Measures Lab Agis Ch1: Getting started Ch2: Entering data: using the data editor Ch4: Basic Stata commands, do files, and log files Project: Groups formed and submitted to ELMS/pages
3	Sept 22	Sfbe Ch4: Introduction to Probability Lab Mit Ch2: Reading and writing datasets (Stata and non-Stata) Lab Introduction to Latex and WYSIWYG editor LYX *Hw1 release*
4	Sept 29	Sfbe Ch5: Discrete probability distributions Sfbe Ch6: Continuous probability distributions Lab Agis CH5: Descriptive statistics and graphs for one variable *Hw2 release* Project: Topics proposal submitted
5	Oct 6	Sfbe Ch7: Sampling and sampling distribution Lab Agis Ch6: Statistics and graphs for two variables Lab Mit Ch4: Labeling datasets Ch5: Creating variables *Hw1 submission*
	Oct 13	FALL BREAK: No class
6	Oct 17 FRI ZOOM	MAKE UP CLASS: ZOOM (link: see ELMS/pages Makeup class) Sfbe Ch8: Confidence Interval Estimation Ch9: Hypothesis Testing Lab Mit Ch6: Combining datasets: merging one-to-one and one-to-many

		Hw2 submission
7	Oct 20	Sfbe Ch10: Inference about means and proportions with two populations Lab Agis Ch7: Tests for two means **QUIZ 1**
8	Oct 27	Midterm exam
9	Nov 3	Discussion of the midterm exam Sfbe Ch11: Inference about population variances Ch12: Comparing multiple proportions, tests of independence, goodness of fit
10	Nov 10	Sfbe Ch13: Experimental design and analysis of variance (Anova) Lab Agis Ch9: Analysis of variance *Hw3 release* <u>Project first draft submitted</u> *<u>Presentation 1</u>*
11	Nov 17	Sfbe Ch14: Simple linear regression Lab Agis Ch8: Linear regression *<u>Presentation 2</u>*
12	Nov 24	Sfbe Ch14: Simple linear regression Lab: Reporting regression results in LATEX, Stata I/O *Hw3 submission, Hw4 release* *<u>Presentation 3</u>*
13	Dec 1	Lab: Programming for data management: if clauses, boolean conditions, combinations of boolean conditions, for and while loops *<u>Presentation 4</u>*
14	Dec 8	If time permits, one of: Lab: Regular expressions, regular expressions in Stata (and Stata loops) Lab: Example: Technology or Trade? Review for Final *Hw4 submission* *<u>Presentation 5</u>*
15	Dec 15	Final exam <u>Project final draft submitted</u>

2. Grading and related issues
2.1 Types of evaluation:
(a) Exam: Midterm 27%, Final 27%
(b) Assignments (4, 5% each, in total 20%)
(c) Course project 10%
(d) Presentation 6%
(e) Quizzes: 2 quizzes in the term, each 5%, total 10%

(a) Exams: Final on the above date. See "Excused Absences" under "Other Policies" for permissible exceptions. All exams are in-person and proctored. No collaboration is permitted. Open book, you can use old scripts (from your preparation and class material). However, it is not allowed to copy and paste entire AI-generated segments of code, such as entire blocks of code or entire functions/classes.

(b) Assignments: There will be four assignments. All assignments must be submitted through ELMS. You may solve and discuss the assignments in groups; however, every student is required to submit an assignment of his/her own. You are also encouraged to discuss any problems/questions relating to the assignments with your TA. The schedule for the assignments is as follows:

	Release	Submission
Hw 1	Sept 22	Oct 6
Hw 2	Sept 29	Oct 17
Hw 3	Nov 10	Nov 24
Hw 4	Nov 24	Dec 8

Late submissions are not accepted.

(c) Course Project

In the project for this course, students are required to come up with an important economic question and answer it with the tools learned in this course. Students are required to clearly outline why this question is relevant, how to best formulate a hypothesis to test this question, and show the results in no more than 6 pages of text (including tables and graphs). Students should also carefully explain how this question and their results relate to the relevant economic literature.

In principle, students are free to choose any dataset and any question that they find interesting and that can motivate them. However, since this is an introductory class, in practice, students will focus on the partial replication of a published paper that **has accessible data**. Please observe that the availability of data is usually a **binding constraint**; therefore, be completely sure that the data exists and is public before choosing your project.

A typical project will therefore involve the following:
- The loading and manipulation of at least a subset of the datasets used in the article
- A thorough analysis of the data in terms of descriptive statistics (with tables and graphs)
- A partial replication of the results of the article using the techniques studied in the course (linear regression, variance analysis, etc).

The final product is a zip file containing all code and data, as well as a report. The code should be executable such that I can reproduce your results. The report can be written in Word or Latex. All tables and graphs must be contained in the document.

Timeline for the project:
- Course week 2: Groups have been formed and submitted to ELMS/pages (with email of the corresponding author)
- Course week 4: Topics proposal to be submitted via ELMS
- Course week 10: First draft containing the complete descriptive analysis
- Course week 15: Submission of the final draft via ELMS

(d) Presentation

Each group will give a short presentation (max 15min). The presentation will be about the course project. In general, there will be one or two presentations per week, beginning in course week 10 (depending on the number of students). The presentation consists of an overview of the paper and a discussion of the main results. A first draft of the presentation has to be submitted to ckrestel@umd.edu a week before the presentation. You will receive feedback that should be incorporated into your presentation.

(e) Quizzes: There are two quizzes. The emphasis of each quiz will be on the material of the last lecture. Since the course is cumulative, I will, however, assume that you are familiar with all the topics and programming techniques that we have seen before.

- First quiz: Oct 20 (week 7)
- Second quiz: Random between week 9 and 14.

2.2 Grades

At the end of the term, every student will have a numerical course grade between 0 and 100. I will decide upon the numerical cutoffs between various letter grades based on my professional judgment. I will consider students' performance relative to the class. I will also consider absolute standards of professional competence. Highly competent students will get A's. Barely competent students will get B's. Grades of B-'s or worse indicate work that is below the minimum acceptable standards of our program.

The cutoffs that I use will respect the ordinal ranking of numerical course grades. No student with a given numerical course grade will receive a lower letter grade than someone else with a lower numerical course grade.

Observe that A+ may be given for exceptional achievement for the students at the top of the distribution.

3. Standard Policies

Policies related to all graduate courses at the University of Maryland are posted on this page of the Graduate School's website:
https://gradschool.umd.edu/faculty-and-staff/course-related-policies

Please familiarize yourself with these policies related academic integrity, non-discrimination policy, accessibility, absences and accommodations, grading, academic standing, grievance procedures, and other important policies.

Workload: Mastering the material covered in this course requires a significant amount of work outside of class. Students should expect to spend more time outside of class than in class – typically at least twice as much time. In a regular 15-week semester (as in the College Park version of our program): Taking 3 master's-level courses is supposed to approach the time commitment of a full-time job (~36-39 hours per week, so 12-13 hours per week per course). Taking 3 master's-level courses while simultaneously working at a demanding full-time job during the day is not advisable.

Academic Progress: The graduate school requires that students maintain a GPA of at least 3.0. Students whose cumulative GPA falls below 3.0 will be placed on academic probation by the graduate school. Students who fail to bring their GPA up to at least 3.0 after a semester on academic probation must ask the program's director to petition the Graduate School if they want to remain in the program. The petition must include a plan for getting the student's GPA up to at least 3.0. Students who do not live up to their plan can be forced to leave the program without having earned the degree. Note: a grade of "B" corresponds to a GPA of 3.0. A grade of "B-" corresponds to a GPA of 2.7.

Excused Absences: If you miss any class meetings for any reason, you are still responsible for all material covered during the meeting you missed. It is your responsibility to work with study partners, the teaching assistant, and the instructor to make sure you catch up on the missed material. Instructors routinely facilitate things by posting lecture notes, etc. If you need to miss an exam or other graded course requirement because of illness, injury, or some other emergency. Follow the doctor's orders and get documentation. Get in touch with the instructor as soon as you're able – preferably prior to missing the exam or deadline. Communicate with the instructor to make up the course requirement as soon as possible. You are entitled to recover before you make up the course requirement, but you are not entitled to extra days to study beyond the time the doctor's note says you've been incapacitated. If you are incapacitated for more than a week or so beyond the end of the term, your grade in the course will be an "Incomplete." In such cases, you must negotiate a plan with your instructor for completing the course requirements. Once you make up the course requirement, the instructor will change your "I" to the appropriate letter grade.

School Closings and Delays: Information regarding official University closing and delays can be found on the campus website and the snow phone line: (301) 405-SNOW (405-7669) The program director will also announce cancellation information to the program as an announcement on the program's ELMS/Canvas site. This will generally be done by 1:00 p.m. on days when weather or other factors are an issue. When classes need to be canceled during the semester, we make every effort to schedule makeup classes.

Laptop Computer Requirement: Completing some of this course's requirements will require a laptop computer (not a notebook or a tablet!) with at least 1 GB of RAM and at least 5 GB of free space available on the hard drive. We recommend laptops with at least a 15-inch screen. Screens smaller than 13 inches are probably not practical.

UMD Counseling Center: Sometimes students experience academic, personal, and/or emotional distress. The UMD Counseling Center in Shoemaker Hall provides comprehensive and confidential support services that promote personal, social, and academic success. The cost of these services is covered by the fees you already paid when you registered for classes, and there is no additional charge if you use the services. Proactively explore the range of services available, including the Counseling Service, Accessibility and Disability Service, and the Testing Office, all described at http://www.counseling.umd.edu/

Graduate Academic Counselor: The UMD Graduate School also has an academic counselor available to support students who are having difficulty navigating mental health resources on campus, are considering a leave of absence, and/or need assistance finding mental health care off campus. The Graduate Academic Counselor also facilitates bi-weekly Graduate Student Circle Sessions, which provide an opportunity to learn about resources and connect with other graduate students. Students can learn more about the Graduate Academic Counselor by going to:

https://gradschool.umd.edu/gradcounselor

UMD Accessibility & Disability Service: The University of Maryland is committed to creating and maintaining a welcoming and inclusive educational, working, and living environment for people of all abilities. The University of Maryland is also committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the University, or be subjected to discrimination. The Accessibility & Disability Service (ADS) provides reasonable accommodations to qualified individuals to provide equal access to services, programs, and activities. ADS cannot assist retroactively, so it is generally best to request accommodations several weeks before the semester begins or as soon as a disability becomes known. Any student who needs accommodations should contact ADS as soon as possible so that they have sufficient time to make arrangements. For assistance in obtaining an accommodation, contact Accessibility and Disability Service at 301-314-7682, or email them at adsfrontdesk@umd.edu. Information about sharing your accommodation letter, discussing accommodation logistics, and getting assistance from ADS staff, and more can be found on the ADS website.

Course Evaluations: Near the end of the term, you will receive an email inviting you to submit a voluntary and anonymous course evaluation. Your feedback on courses will be very helpful in improving the quality of instruction in our program.

Access to Morrill Hall and Morrill 1102: Morrill Hall is locked every day from 7:00 p.m. - 7:00 a.m. Your university ID gives you swipe access to the back door of the building. There is keypad access to the door of Morrill 1102. The code will be shared with students by the program coordinator.