

Master of Science in Applied Economics
University of Maryland, College Park
(Washington, DC location)
ECON 643-PR01: Empirical Analysis I
Spring 2024

Syllabus – Revised **2023-02-23**

Instructor: John Straub (Straub@umd.edu)

Office Hours: Mondays via Zoom from 5:15-6:15 PM, and by appointment

<https://umd.zoom.us/j/93091359801>

Teaching Assistant: Jose Fellmann (fellmann@umd.edu)

TA Office Hours: Sunday via Zoom 5 - 6 pm, and by appointment

<https://umd.zoom.us/j/95621559351?pwd=dG40aEcwcHVNcIVjMHRpeUNzVnJRQT09>

Prerequisites:

Admission to the Master of Science Program in Applied Economics.

Class meets: 1400 16th Street, NW, suite 140

Wednesdays 6:45-9:30 PM, with a 15-minute break somewhere between 7:30 and 8:15.

Notes: The midterm exam will be on **Wednesday, April 26th**

The final exam is scheduled for **Wednesday, May 15th**

The final course project is due by **noon on Saturday, May 18th**

General Description and 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 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 assessing 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.

Depending on the focus of a student's replication project, learning outcome 4 can also come into play.

Students will master basic statistics at a level of rigor befitting a STEM-designated professional master of science degree program in applied economics. Students will be able to perform basic statistical analysis using STATA software. Students will be able to interpret basic statistical results correctly and communicate them professionally in English. Upon completion of the course, students will be prepared to study applied econometrics in ECON 644.

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 <https://elms.umd.edu/>. You will need to use your University of Maryland "directory ID" and password.

Email: The University has adopted email as the primary means of communication outside the classroom, and I will use it to inform you of important announcements. The University creates an "@umd.edu" email address for every graduate student. All official UMD communications will be sent to students at their "@umd.edu" email address. You are responsible for reading your @umd.edu email address, including ELMS/Canvas Announcements I send to the class. You should make sure ELMS/Canvas Announcements and messages are forwarded to an email address that you check regularly. Failure to check email, errors in forwarding email, and returned email due to "mailbox full" or "user unknown" will not excuse a student from missing announcements or deadlines.

I will do my best to respond to email within 36 hours. I prefer that you contact me via email to straub@umd.edu, rather than through the ELMS/Canvas messaging system, though I will reply to either kind of message.

Required Textbooks

SfBE: *Statistics for Business and Economics* by Anderson, Sweeney, Williams, Camm, and Cochran, Cengage, 13th or 14th edition.

AGIS: *A Gentle Introduction to Stata* by Acock (Stata Press), 5th or 6th ed.

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

NYT: Students must purchase an online subscription to the New York Times. Unfortunately, the online access to the New York Times that's available through the UMD library systems will not do. Students need their own individual subscriptions directly with the New York Times so they can see the graphs, and so they can easily search for certain types of articles, as will be explained in class. Fortunately [student subscriptions](#) to the New York Times cost just \$1 per week and can be cancelled at any time.

Required Statistical Software: STATA, version 15 or 16.

Note: Stata is not available through Terpware, but many other software packages, including the Microsoft Office suite which includes Microsoft Excel, are available for free or at a discount to University of Maryland students via Terpware: <https://terpware.umd.edu/Windows> or <https://terpware.umd.edu/Mac>

Stata Purchasing Options

Students in our program are required to purchase Stata. Stata offers different "flavors" and different lengths of licensing. Price varies according to these two factors. Stata also offers discounted pricing for students.

Stata/BE is the least expensive version of Stata, and is a sufficient version for your coursework in this program. With a single-user license, you can install Stata on up to three computers. Description of all the "flavors" are given here:

<http://www.stata.com/products/which-stata-is-right-for-me/>

The most cost-effective license duration is to purchase a perpetual license (which never expires). The student price for a perpetual Stata/BE license is \$225. The student price for an annual license is \$94, so more expensive if you end up using Stata for longer than 1 year – which you will do just to graduate from our program. Most of our graduates continue to use Stata even after they graduate, so the \$225 perpetual license is worthwhile. Perpetual license holders are also entitled to discounted Stata upgrades in the future.

Here is the link for student single-user purchase:

<https://www.stata.com/order/new/edu/profplus/student-pricing/>

If you have a STATA account, you will be able to proceed to the checkout normally. If you don't have an account, you will need to create one. During this step, make sure to include the information related to your student-status at UMD so as to get the discount. You will need to provide your UMD email address, the name of the university and the department you're in, and basic personal information.

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.

Schedule (revisions, if any, will be announced in class, and by ELMS/Canvas Announcement)

Except where noted below, the class will meet on Wednesday evenings between February 28th and May 15th.

2/28: Meet each other and introduce the course
TA presentation on how to submit HW electronically via ELMS
SfBE, Ch. 1: Data and Statistics
Introduction to online discussion utility in ELMS
SfBE, Ch. 2: Descriptive Statistics: Tabular and Graphical Display

3/6: Computer lab: **Acock, Ch.1:** Getting Started with Stata
Preview of HW3 and HW4
Discussion of Course Project Proposal Details
Discussion of scheduling and grading student presentations and online discussions
SfBE, Ch. 3: Descriptive Statistics: Numerical Measures

Saturday online meeting via Zoom:

3/9: 10:30-11:30 AM: **SfBE, Ch. 4:** Introduction to Probability
11:30-12:15: Lunch break
12:15-1:15: Computer lab: **Acock, Ch. 4:** Basic Stata commands and Do-files

Additional asynchronous online video mini-lectures this week:

- Example presentation by the instructor: The Effect of Fundraising on Charitable Contributions
- Special Topic: Respect and Engagement in a Graduate Seminar

Note that the Saturday 3/9 online class meeting consists of two synchronous 60-minute Zoom sessions with a 45-minute lunch break between them. There are also 2 asynchronous mini-lectures posted on the course website. We are scheduling this "extra" online meeting on a Saturday so the class can meet with me 12 times between 2/28 and 5/15, despite there being no meeting on Wednesday 3/20 (spring break).

3/13: Computer lab: Reading non-Stata datasets into Stata (**Mitchell, Ch. 2**)
Computer lab: **Acock, Ch. 5:** Descriptive Analysis Using Stata

Course Project Proposal due at exactly 12:00 noon on Saturday 3/16.

3/20: No class on 3/20 due to spring break.

3/27: **SfBE, Ch. 5:** Discrete Probability Distributions
Post-Proposal discussion of Course Project details
SfBE, Ch. 6: Continuous Probability Distributions

4/3: **SfBE, Ch. 7:** Sampling and Sampling Distributions
Student Presentation(s):
Computer lab: TBA

4/10: **SfBE, Ch. 8:** Confidence Interval Estimation
Student Presentation(s):
SfBE, Ch. 9: Hypothesis Tests

4/17: **SfBE, Ch. 10:** Inference about Means and Proportions with Two Populations
Acock, Ch. 7: Tests for One or Two Means
Student Presentation(s):
Computer lab: 2-sample t-tests (Stock and Watson, E3.1 – CPS wage gaps)

4/24: 6:45-8:30: **“Midterm” Exam**
8:45-9:30: Selected topics from:
SfBE, Ch. 11: Inferences about Population Variances
SfBE, Ch. 12: Comparing Multiple Proportions, Tests of Independence and Goodness of Fit
SfBE, Ch. 13: Experimental Design and Analysis of Variance
AGIS, Ch. 9: Analysis of Variance

Sunday 4/28: First draft of final course project due via email by 12:00 noon.
Students will have written feedback on first draft of final course project by 11:59 PM on Monday 5/8.

5/1: **SfBE, Ch. 14:** Simple (aka Bivariate) Linear Regression (**Stock & Watson, Ch. 4**)
Student Presentation(s):
Computer lab: **Acock, Ch. 8:** Simple (Bivariate) Linear Regression with Stata
Computer lab: Stock and Watson E4.2 and E5.2 (Teaching Ratings)

Meetings to work on project and discuss first draft feedback.

After 5/1, students should be following up on the instructor feedback on the first draft of their course project. Course project groups must schedule private Zoom meetings with the instructor. The meetings can be scheduled any time between Thursday 5/2 and Friday 5/10. Students are expected to share initial reactions to the written feedback on their first drafts, and to show initial progress in following up on that feedback. Students’ participation in these meetings will be graded. Additional details will be posted on ELMS.

5/8: Introduction to Omitted Variable Bias and Multiple Regression (**Stock and Watson, Ch. 6**)
Student Presentation(s)
Computer Lab: Stock and Watson E6.1 (Teaching Ratings continued)

Saturday 5/11: Optional Practice Exam and Optional Final Exam Review Session
in person at 1400 16th St.

9:30-11:30: Optional Practice Exam
11:30-12:30: Lunch break
12:30-1:30: Optional Review Session

Practice exam and solution for practice exam will be posted on ELMS after the review session.

5/15: **Final Exam**

Saturday 5/18: Final draft of course project due via email by 12:00 noon.

Graded Course Components

There are 6 graded components to the course. The 6 components and their relative weights in the course grade are: homework (15%), presentations (15%), online discussions (5%) midterm exam (15%) final exam (25%) and the course project (25%).

Homework (15 course points)

Each week prior to the midterm exam, I will assign a few HW problems that correspond to the material covered that week in class. HW assignments will always be posted to the Assignments section of the course ELMS/Canvas page. I will usually post the HW assignments as MS-Word documents, MS-Excel files, and/or Stata do-files. Students are to edit the files I post, adding their answers. The edited files are what students will submit electronically via ELMS.

HW will only be collected and graded prior to the midterm exam. After the midterm exam, students need to turn their attention to their course projects.

Each HW assignment will be worth some number of raw points. The amount of HW assigned each week will vary, as will the raw points at stake each week. After the final HW assignment has been graded, each student will have earned some proportion of the total raw HW points. Their overall HW score will be based on the proportion of possible points earned. For example, a student who earns 86% of all the possible HW points will receive 12.9 of the 15 possible HW points ($0.86 * 15 = 12.9$).

Presentations (15 points)

Each student will (with a partner or two) give a short (10-minute) presentation at some point during the term. We will have a student presentation during 5 of our 12 meetings: each meeting from 4/3 to 5/8, except for the week of 4/24 (midterm exam). The presentations will focus on the research paper that the students are using as the basis for their course replication project, and will feature at least one graph depicting some empirical evidence.

Assuming we have between 10 and 15 students, the 5 student course project groups will each consist of 2 or 3 students.

A presentation grading rubric is posted on the course ELMS/Canvas website. I will give an example presentation during the third meeting of the course. The presentations will be graded on a 10-point scale.

Students will also receive a grade between 0 and 3 based on how well they initially respond to post-presentation questions from the instructor and their fellow students. Each member of a presenting group will take responsibility for responding to half or one-third of the online discussion threads related to their presentation. The partners can decide among themselves who will be responsible for which thread. They can discuss all the threads with each other before posting responses, but each student will be graded individually based on the quality of responses that they personally post.

Students must also engage with the presentations of other students. We do not have enough time for lengthy live discussions in class of all the student presentations, but audience members will be asked to formulate written reactions to presentations. Each week the non-presenting students are required to discuss the presentations of other students with their own course project partner(s). Each non-presenting group must send an email to the instructor (one email per group). The email will suggest a constructive question/observation/suggestion that could serve as the opening of an online discussion thread about that week's student presentation. The instructor will provide private feedback on the emails, and open discussion threads based on the non-presenting students' questions/observations/suggestions. At the end of the term, each student project group will receive a grade on a 2-point scale for the quality of their engagement with the presentations of other students. Groups who submit questions/observations/suggestions that are constructive and insightful will get grades of 1.8 or higher (A/A-). Questions/observations/suggestions that are less so will get lower grades. My weekly private feedback on the presentation emails will help students learn what's expected over the course of the term. The end-of-term grade will be based on the quality of engagement attained by the end of the term.

So the 15 course points related to presentations are: 10 for the presentation itself, 3 for the quality of your initial response to the post-presentation questions, and 2 for the quality of the emails you send in reaction to the presentations of other presenters.

Presenters are required to send complete first drafts of their PowerPoint slides to me via email at straub@umd.edu by noon on the Sunday before they present. I will reply with feedback by noon on Monday. The actual presentation must include revisions that address the feedback. Final drafts are due at

the same email address by noon on Wednesday. Presenters can also schedule a Zoom call with me to discuss my feedback on their presentation.

Online Discussions (5 course points)

We will not have enough time for lengthy discussions of all the student presentations during class. Most of the discussion will take place asynchronously in online discussion boards. Each week after class, I will open several discussion threads related to that week's student presentation(s). Many of the threads will be inspired by the post-presentation emails that audience members have sent. I will try to always open the online discussions by 11:59 PM after class each week.

The presenters will have until 12:00 noon on Friday to make initial replies to each thread of the online discussion.

From noon on Friday until noon on Saturday, one member of each non-presenting group must make one and only one contribution to any thread in the discussion, or open a new thread.

From noon on Saturday until noon on Sunday, each other non-presenting student must make one and only one additional contribution to the discussion, in response to something posted by someone else.

I will read what's being posted, respond to some things, and redirect the discussion as necessary.

Presenters are expected to participate in the online discussion of their own presentation through 11:59 PM on Sunday. (After noon on Sunday they can still be responding to things that others have posted as late as noon on Sunday.)

The 5 online discussion points will be awarded based on the quality of your engagement with the subsequent discussion of your own presentation after noon on Friday (0-to-5 possible points), and a "participation factor" reflecting the proportion of discussions to which you contribute in weeks when you are not presenting (0% to 100%).

Each partner will receive the same grade for the presentation itself (on a 10-point scale, as described above). But each partner will be graded individually for the quality of his or her engagement in the online discussion that follows after noon on Friday. The quality of this engagement will be graded subjectively by me on a 5-point scale. Each member of a presenting group will be responsible for engaging in the discussion that follows after noon on Friday in the threads where they have made the initial response. If you are unsure how to engage with some of the comments in the discussion of your own presentation, you can Zoom with me on Saturday or Sunday to discuss.

The online discussion grade will also be scaled by a "participation factor." There will be online discussions in 5 different weeks. Each student is expected to make 1 contribution in each of the 4 weeks when they are not presenting. Students who contribute in all 4 weeks will have a participation factor of $4/4 = 1.0$. Students who contribute in just 3 of the 4 weeks will have a participation factor of $3/4 = 0.75$. And so on.

Example online discussion grade calculation: If a student earns 4.4 of the 5.0 possible "quality of engagement" points, and participates in 3 of the 4 weeks when not presenting, that student's online discussion grade would be $0.75 * 4.4 = 3.3/5.0$.

Midterm Exam (15 course points)

The midterm exam will test everything covered in the course through the previous week.

Final Exam (25 course points)

I will prepare an exam that I think students should be able to complete in 2 hours, though students are welcome to use 2 hours and 45 minutes from 6:45-9:30. The final exam will be cumulative.

The midterm and final exams will begin at 6:45 PM (see course schedule for dates). Some or all of both exams will consist of a series of empirical problems to be solved using Stata and submitted electronically. Both exams will be open book, open note. I will personally proctor the exams and be available to address clarifying questions during the exam. Students can use whatever notes they like, including online resources. But communication with anyone else by any means is prohibited while taking an exam. Communication with anyone by phone, email, text message, online chat, or any other means would be cheating. Students are advised to prepare a compact sheet or two of the most important formulas for quick reference. Students who spend too much time leafing through books and web pages will run out of time.

Course Project (25 course points)

Students are required to apply the skills they learn in the course to an empirical replication project. Students will work in groups of 2 or 3 on the project. To complete the project students will find a published paper of interest that also has accessible data. They will read at least some of the data into Stata, organize and summarize the data appropriately, and perform some analysis of the data. The final draft of the course project will include a thorough descriptive analysis and a small regression analysis.

Students will submit the course project work in 4 installments (see the Schedule for due dates):

- Topic Proposal (2 points)
- Complete first draft of course project, including descriptive analysis (10 points)
- Follow-up and discussion of first draft feedback with me (3 points)
- Final draft of completed course project (10 points)

Additional details and guidance related to all 4 components of the course project will be provided in class and on the course’s ELMS/Canvas website.

Final Course Letter Grades

At the end of the semester I will add up each student’s course points. This will be a number between 0 and 100. I do not grade on a curve. Numerical course grades will be translated into letter grades as follows:

93-100	90-92	80-89	70-79	60-69	50-59	40-49	30-39	20-29	10-19	0-9
A	A-	B+	B	B-	C+	C	C-	D+	D	F

At my discretion, I might (or might not) give an A+ to a student or two at the very top of the class’ grade distribution.

UMD Grad School and Program-level 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 to academic integrity, non-discrimination policy, accessibility, absences and accommodations, grading, academic standing, grievance procedures, and other important policies.

Email: The University has adopted email as the primary means of communication outside of the classroom, and the instructor will use it to inform students of important announcements. The University creates an "[@umd.edu](mailto:)" email address for every graduate student. All official UMD communications will be sent to students at their "[@umd.edu](mailto:)" email address. Students are responsible for reading their [@umd.edu](mailto:) email, including ELMS/Canvas Announcements that are sent to the class. Students should make sure that ELMS/Canvas Announcements and messages are forwarded to an email address that they check regularly. Failure to check email, errors in forwarding email, and returned email due to “mailbox full” or “user unknown” will not excuse a student from missing announcements or deadlines. The instructor will do their best to respond to email within 36 hours.

Contact Hours: Three credit master’s-level courses at the University of Maryland require a minimum amount of contact between instructors and students. Our courses’ 12 weekly meetings only satisfy 80% of the university’s contact requirement. The other 20% is satisfied by weekly mandatory and graded online contact. In principle, the contact hours requirement could be satisfied by scheduling 3 additional

150-minute meetings per term, or 6 additional 75-minute meetings, or 10 additional 45-minute meetings. But in practice the contact hours requirement is satisfied by the weekly online discussion boards. The weekly online discussions are a more flexible way to ensure that our program's courses in DC provide the same level of student-instructor contact as the traditional 15-week face-to-face version of the same course when it is taught on campus in College Park.

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. Students with questions about the workload in this program should speak with one of the program directors.

The courses in our DC program are 12-week courses that cover all the same material as a traditional semester-long 3-credit course (15 weeks). The compressed schedule makes it possible to complete our degree in just 15 months if you take 2 courses each term. But the compressed schedule also implies an accelerated pace with an average of 25% more work per week in a given course ($15/12 = 1.25$). So maybe about 15 hours of work per week per course. The weekly workload when taking 2 of our DC courses per term is equivalent to the weekly load from 2.5 "normal" 15-week courses - so maybe about 30 hours per week. Students who take 2 courses per quarter in our DC program complete 8 courses per year. So over the course of a year, taking 2 courses per quarter in our DC program is equivalent to 133% of a full-time load ($8/6 = 1.33$).

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 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 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.

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 at <http://www.counseling.umd.edu/>

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.

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>

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.

Building Access: There is a smartphone app that can be used to enter our building after normal business hours. The program coordinator will provide information about this. We will also provide information about the code for entering the front door of our suite. Please make sure you are receiving the ELMS-Announcements that we send out to the program about these and other important matters.