



ECON 643-PR02: Empirical Analysis I
Foundations of Empirical Research, Fall 2021
Washington, DC location: 1400 16th Street, NW

Syllabus – Revised 08-24-21

Instructor: Thomas Rumbaugh (trumbaugh@umd.edu)

Class meets: The course is “**mostly online**” in the fall of 2021. There will be both synchronous class meetings and asynchronous class content. The synchronous online class meetings will be on Wednesday evenings from 6:30-7:30, and from 8:15-9:15. Asynchronous content is described below.

Note: Students in this “mostly online” section of ECON 643 are **required** to take their midterm and final exams in-person in our Washington, DC suite on the dates indicated below. All other aspects of the course are online. But the midterm and final exams must be taken in person.

Covid-19 Information: Up-to date information about UMD Covid-19 policies and guidance are posted at <https://umd.edu/4Maryland>. Given the evolving nature of the pandemic, the guidance and policies are subject to change. The plans are always coordinated with state and county health officials, with additional guidance provided by the University System of Maryland. The focus will always be on the health and well-being of our entire campus community. We strongly urge all students, staff, and faculty to read announcements they receive about Covid-related guidance and policy, and to stay familiar with the information posted at <https://umd.edu/4Maryland>. We thank you all for your individual efforts to help protect the collective health of our entire community.

Schedule (revisions, if any, will be announced in class, and by ELMS/Canvas Announcement):
Except where noted below, the class will meet on Wednesday nights between September 1st and November 17th.

The **midterm exam** will be on **Wednesday, October 27th at 6:30 PM**
The **final exam** is scheduled for **Wednesday, November 17th, 6:30-9:30 PM**
The **final course project** is due by **noon on Monday, November 15th**.

Office Hours: Tuesdays via Zoom from 6:30-7:30 PM or by appointment

Teaching Assistant: Jake Kramer (KramerJ@umd.edu)

TA Office Hours: Mondays via Zoom from 5:15 – 6:00 PM or by appointment

Prerequisites: Admission to the Master of Science Program in Applied Economics.

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: The 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

Students will master basic statistics at a level of rigor befitting a 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. Students are responsible for updating their current email address via <http://www.registrar.umd.edu/current/> (under the first major heading of "Online Transactions" there is a link to "Update Contact Information"). You are required to pay attention to any ELMS/Canvas Announcements sent 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 24 hours. I prefer that you contact me via email to trumbaugh@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.

We do not recommend Small Stata since it is too limited for the coursework in our program. Stata/IC is the least expensive and sufficient version for your coursework. 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/IC 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/gradplans/student-pricing/>

During the checkout process you will be asked to verify your student status. I believe this can be done by uploading a copy of your student ID, your tuition bill or statement, or verifying your "@umd.edu" email address.

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.

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

- 9/1: 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
- 9/8: 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
- 9/15: **SfBE, Ch. 4:** Introduction to Probability
Example presentation by the instructor: The Effect of Fundraising on Charitable Contributions
Special Topic: Respect and Engagement in a Graduate Seminar
Computer lab: **Acock, Ch. 4:** Basic Stata commands and Do-files

Course Project Proposal due by 6:00 PM on Wednesday 9/22

9/22: Computer lab: Reading non-Stata datasets into Stata (**Mitchell, Ch. 2**)
 Post-Proposal discussion of Course Project details
 Computer lab: **Acock, Ch. 5: Descriptive Analysis Using Stata**

9/29: **SfBE, Ch. 5: Discrete Probability Distributions**
 Student Presentation(s):
SfBE, Ch. 6: Continuous Probability Distributions

10/6: **SfBE, Ch. 7: Sampling and Sampling Distributions**
 Student Presentation(s):
 Computer lab: TBA

10/13: **SfBE, Ch. 8: Confidence Interval Estimation**
 Student Presentation(s):
SfBE, Ch. 9: Hypothesis Tests

10/20: **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)

10/27: **Midterm Exam** (6:30-7:30)

7:45-8:30: 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 10/31: **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 Tuesday 5/11.

11/3: Simple Bivariate Linear Regression (**Stock & Watson, Ch. 4**)
 Student Presentation(s):
 Computer labs:
Acock, Ch. 8: Simple (Bivariate) Linear Regression with Stata
 Stock and Watson E4.2 and E5.2 (Teaching Ratings)

Saturday 11/6 – Friday 11/12: Zoom meetings to discuss first draft feedback.

Course project pairs must schedule private Zoom meetings with the instructor. 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. Student participation in these meetings will be graded. Additional details will be posted on the course ELMS website.

11/10: 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 11/13: Practice Exam and Optional Final Exam Review Session
 9:30-11:30: Optional Practice Exam

11:30-12:30: Lunch break

12:30-1:30: Optional online Review Session

Solution for practice exam will be posted on ELMS after the review session.

11/15: Final draft of course project due by 12:00 noon.

11/17: Final Exam (6:30-9:30 PM)

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%), the 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 be collected and graded on a weekly basis until the midterm exam. After the midterm exam, students need to turn their attention to their course projects. The amount of HW assigned each week will vary, as will the number of points at stake each week. After the final HW assignment has been graded, each student will have earned some proportion of the total 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) give a short (10-minute) presentation at some point during the term. We will have 1 or 2 student presentations per week between 9/29 and 11/10, except for the week of 10/27 (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.

Students will work in pairs on the course project (with 1 group of 3 if we have an odd number of students).

A presentation grading rubric will be posted on the course ELMS/Canvas website. I will give an example presentation during the third week of the course. The presentations will be graded on a scale of 0-to-10. Students will also receive a grade between 0 and 3 based on how well they handle post-presentation questions from the instructor and their fellow students.

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 watch the presentations of other students and discuss them with their own course project partner. Each non-presenting pair must send an email to the instructor (one email per pair of students). The email will suggest a constructive question/observation/suggestion that could serve as the opening of an online discussion thread about one of that week's student presentations. 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 pair will receive a grade on a 2-point scale for the quality of their engagement with the presentations of other students. Project pairs 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

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.

The 15 course points related to presentations are: 10 for the presentation itself, 3 for the post-presentation Q&A with me and the other students, and 2 for the quality of engagement with other people's presentations.

Presenters are required to send complete first drafts of their PowerPoint slides to me via email at trumbaug@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, along with a streamable link to the recording of your presentation. Instructions for how to record presentations, and how to create streamable links, are posted on the course ELMS site. Presenters can also schedule a Zoom call with me on Monday or Tuesday 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. We will have most of the discussions online. 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 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 pair in the class 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.) Presenters who do not actively engage in the discussion of their own presentation will receive low online discussion grades the week of their presentation.

Online discussions will be graded for both participation (a percentage) and content (5 course points). The participation grade will be based on the proportion of online discussions to which a student has contributed. Every student can miss one online discussion without consequence. Missing 2 or more online discussions will hurt a student's participation grade.

A grading rubric related to the quality of student contributions to the online discussions will be posted on the course's ELMS/Canvas website. I do not have enough time to provide content grades and detailed feedback on the quality of every student's online discussion contribution in every single week. I will grade the quality of participation for every student in the week that they present, and in the final week of presentations. For students who present in the final week, I will also grade the quality of their contributions in the week prior to the final week of presentations. In this way, every student will have online discussion quality grades for 2 different weeks – the one in which they have presented, and one in which they were discussing the presentation of other students.

To help students understand the grading criteria for online discussions, I will have private Zoom meetings with a couple student pairs each week to discuss their recent online discussion contributions considering the grading rubric. I cannot have such discussions with every student in the class in any given week. But I will make sure to have at least one such discussion with every student before Thanksgiving. These meetings will usually be scheduled for Mondays or Tuesdays – while the previous week's online

discussion is fresh in our memories. Students can also always request meetings of this kind – or any kind – with me at any time during the term.

The final online discussion grade will be the average of your 2 discussion quality grades (numbers between 0 and 5), multiplied by your participation grade (a number between 0 and 1).

Midterm Exam (15 course points)

The midterm exam will test everything covered in the course through the previous week. Some or all the Midterm will consist of a series of empirical problems to be solved using Stata and submitted electronically.

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 3 hours from 6:30-9:30. The final exam will be cumulative. Some or all the exam will consist of a series of empirical problems to be solved using Stata and submitted electronically.

Exam Process: The midterm and final exams will be posted to the course website at 6:30 PM (see course schedule for dates). Both exams will be open book, open note. I will 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 a lot of 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 pairs on the project, with one group of 3 if we have an odd number of students. 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.

Other Standard Policies for the Program and the University of Maryland

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. 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 each course ($15/12 = 1.25$). The normal full-time load in a master's program is 3 courses per semester, or 6 courses per year. The weekly workload when taking 2 of our DC courses per term is equivalent to the load from 2.5 "normal" 15-week courses - so $2.5/3.0=83\%$ of a full-time load. However, the DC program takes just 1 week off between terms. Students who take 2 courses per quarter in our 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 "normal" full-time load in the traditional semester-based program ($8/6 = 1.33$).

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.

Academic Integrity: The University of Maryland has a nationally recognized Code of Academic Integrity. You should inform yourself about the UMD policies related to academic misconduct: <https://www.studentconduct.umd.edu/home/current-students>

The exams in this course will ask students to affirm the UMD Honor Pledge: "I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination."

Cases of academic misconduct, including plagiarism and giving or receiving unauthorized assistance on exams, will be referred to the UMD Office of Student Conduct. If found responsible for academic misconduct, students can be subject to sanctions. The standard sanction for graduate students found responsible for cheating on exams is expulsion from the university.

Student Conduct: Students are expected to treat each other with respect. Disruptive behavior of any kind will not be tolerated. Students who are unable to show civility to one another or myself will be referred to the Office of Student Conduct. You are expected to adhere to the Code of Student Conduct.

Excused Absences: The University of Maryland's policy on excused absences is posted here: <http://www.president.umd.edu/administration/policies/section-v-student-affairs/v-100g>

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 – not the instructor's – 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're 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. If classes need to be cancelled during the semester, it may be necessary to move the final exam back a week so missed classes can be made up.

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>

Students with Disabilities: The University of Maryland does not discriminate based on differences in age, race, ethnicity, sex, religion, disability, sexual orientation, class, political affiliation, or national origin. Reasonable accommodations will be arranged for students with documented disabilities. Students who have an accommodations letter from the Accessibility and Disability Service (ADS) should meet with me during the first few weeks of the semester to discuss and plan for the implementation of your accommodations. If you require reasonable accommodations but have not yet registered with ADS, please contact the Accessibility and Disability Service at 301-314-7682 or adsfrontdesk@umd.edu.

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.