

ECON 645:
Empirical Analysis III: Econometric Modeling and Forecasting
Spring 2024

University of Maryland, College Park
Master of Science Program in Applied Economics
Washington, DC location: 1400 16th St, NW, Suite 140

Syllabus Version (2/18/2023)
Lecturer: Samuel Rowe
Email: srowe124@umd.edu

Course Meeting: Monday 6:45pm-9:30pm, 1400 16th St, NW, Suite 140
There will be a 15-minute break between 7:45 and 8:30.
Office Hours: Friday 5:30-6:30pm by appointment via Zoom or by request appointment
Course prerequisites: ECON 644

TA: Nabil Ryandiansyah (ryandian@umd.edu)
TA Office Hours: Saturday 9:00-10:00am by appointment via Zoom

Please note that the views do not represent the Health Resources and Services Administration or the Department of Health and Human Resources.

Course description: This is a course in applied econometrics, emphasizing the implementation of modern econometric techniques to analyze concrete economic problems, using real data and recent econometric software. Though not a theoretical course, we will introduce some basic theory and concepts to motivate an appropriate use of the methods.

Our program has 7 general learning objectives:

- 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, 6, and 7

At the end of the course, you should be able to build, estimate and interpret your own econometric models for concrete economic problems, write professional reports/papers using econometric methods, use STATA software for econometric and statistical analysis, and understand empirical papers in the field of economics and gain sense of what makes an empirical paper convincing.

Overview

- The first part of the class will generally cover course content
- The second part of class will either cover course content, computer lab with Stata practice, and/or student presentations
- We will cover relevant research articles during our online discussions

Textbooks

Required:

- Introductory Econometrics: A Modern Approach, 7 edition, Jeffrey M. Wooldridge. (2018)
- Data Management Using STATA: A practical Handbook, Michael N. Mitchell (2010 or 2020)
- Copies of the syllabus, lecture notes, problem sets and other relevant documents will be made available through the course website.
- We will use STATA for the empirical analysis. You can order a student version which is discounted. Information on how to order STATA is available below.

Recommended:

- Mostly Harmless Econometrics: An Empiricist's Companion, Angrist and Pischke (2009)
- Introduction to Econometrics by Stock and Watson, 4th ed.

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. I recommend a laptop with at least a 13-inch screen and at least 4 GB of RAM. Screens smaller than 13 inches are probably not practical.

Purchasing Stata: Students in our program must purchase Stata. Stata offers different "flavors" and different lengths of licensing. Price varies according to these two factors. Stata/BE 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/>

There are two ways to obtain Stata: 1) Student Pricing and 2) Prof+Plan.

I recommend the student-pricing plan. Student Pricing offers additional options with lower prices. If you wish to buy a 6-month license (\$48 for Stata/BE), an annual license (\$94 for Stata/BE), or a perpetual license (\$225 for Stata/BE), you need to order it as a regular student using the following link: <https://www.stata.com/order/new/edu/gradplans/student-pricing/>.

The perpetual license does not expire and is the most cost effective option assuming that you will stay in the program for at least 15 months. There are also upgrade discounts provided to perpetual license holders. During the checkout process you will be asked to verify your "@umd.edu" email address.

You can obtain Stata through the Campus GradPlan/Stata Prof+Plan, in which University of Maryland, College Park is a participating institution. To benefit from the discounted prices, click on the link below and pick the Stata version you would like to buy. (Note: Disregard the warning at the top which states that you must be a faculty or staff member. That is not correct.)

<http://www.stata.com/order/new/edu/gradplans/campus-gradplan/>. Through the Campus GradPlan/Stata Prof+Plan you can buy an annual (\$145 for Stata/BE). However, I would recommend a perpetual license for \$225 as state above.

During the checkout process you will be asked to upload a copy of your student ID or another document as a proof of your enrollment.

Grading:

- Midterm: 25%
- Final: 30%
- Problem Sets: 20%
- Presentation/Replication Project: 15%
- Online Discussion: 10%

Exams:

The midterm will cover material from week 1 through week 5, which will include: omitted variable bias, endogeneity, specification, instrumental variables, panel data, and natural experiments.

The final will cover material from week 6 through week 11, which will include: natural experiments, logit, probit, tobit, sample selection correction, and times series.

Problem Sets:

The problem sets will include both theoretical and empirical questions. You will have one to two weeks to complete the assignment. You can discuss the problem sets with your classmates, but your work must be original and your own. All problem sets will need to be submitted electronically through ELMS. Please include: your do file, log file, and document file (.docx or .pdf). Answers will be posted on ELMS soon after the assignment is due.

Presentation/Replication Project:

Students will work in groups of 2-4 depending upon the size of the class. Students will sign up for a topic related to the course using the Pages tab on ELMS. The assignment will consist of the following: 1) replicate the main results of the author(s) as a group via Stata, and 2) present and discuss main empirical results of the paper in a 20-minute presentation, and 3) Provide feedback on potential empirical issues and critiques on material that we have discussed during the course. The topics and replication material will be provided on ELMS. All presentations will be discussed in the second half of the class after our break, and we will spend a 15-minutes afterwards discussing the research.

The group of students will need to submit a draft of the presentation and the .do and .log files for the replication no later than 11:59pm on the Thursday before the presentation via ELMS. I will

provide feedback usually by Saturday evening that will need to be incorporate into the presentation.

Presentation/replication materials will include: *Instrumental Variable, Panel Data/Fixed Effects, Natural Experiments, and Simultaneous Equations* which will be available on ELMS.

Online Discussion:

I will post a question or series of questions relevant to the course material every Friday evening. The discussion might cover an academic article, a newspaper article covering academic articles, or a published evaluation. The discussion will be open until Wednesday at midnight for you to comment/respond. I will check in to participate/respond/redirect. To fulfill this requirement, you may either create your own post in response to my original post, or write a substantive response to another student’s post that contributes to the discussion. Each discussion session will be graded out of 10 points, with the following benchmarks:

- Participated in and furthered the discussion (10)
- Participated in a meaningful way (8)
- Participated but did not in a meaningful way (4)
- Late or unsubmitted (0)

Final Grade:

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

Course Outline

Week	Date	Topic	Due Date
Week 1	Monday: 2/26/2024	Introduction, Endogeneity, Omitted Variable Bias, Misspecification, Simultaneity, Measurement Error Wooldridge: Chp 3.3, 9.4, 9.5	
Week 2	Monday: 3/4/2024	Instrumental Variables and 2SLS Wooldridge: Chp 15.1-15.5 Mitchell (2010): Review of Chp 2,3,4, 10.3	
Week 3	Monday: 3/11/2024	Panel Data Part 1 Wooldridge: Chp 13 Mitchell (2010): Chp 5.1-5.7	
	Monday: 3/18/2024	No Class (Spring Break)	

Week 4	Monday: 3/25/2024 Virtual Meeting through Zoom	Panel Data Part 2 Wooldridge: Chp 14.1-14.3 Mitchell (2010): Chp 6	Presentation: IV
Week 5	Monday: 4/1/2024	Natural Experiments and Introduction to Difference-in-Differences Wooldridge: 13.2 Mitchell (2010): Chp 6,7	Problem Set 1 Due
Week 6	Monday: 4/8/2024	Midterm	
Week 7	Friday 4/12/2024	Simultaneous Equations Wooldridge: Chp 16.1-16.4 Mitchell: Chp 9	Problem Set 2 Due Presentation: Panel Data
Week 8	Monday: 4/15/2024	Limited Dependent Variables: Logit, Probit, Tobit, Poisson Wooldridge: Chp 7.5, 17.1-17.3 Mitchell: Chp 8,9	Presentation: Natural Experiments
Week 9	Monday: 4/22/2024	Limited Dependent Variables Part 2: Sample Selection Wooldridge: 17.4-17.5 Stata: Using estout	HW Set 3 Due
Week 10	Monday: 4/29/2024	Time Series Part 1 Wooldridge: Chp 10-12	Presentation: Simultaneous Equations
Week 11	Monday: 5/6/2024	Time Series Part 2 Wooldridge: Chp 10-12	HW Set 4
Week 12	Monday: 5/13/2024	Final	

Academic Integrity:

The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. The Code sets standards applicable to both undergraduate and graduate students, and you are responsible for upholding these standards as you complete your assignments and examinations in the course. You should inform yourself about the UMD policies related to academic misconduct: <https://studentconduct.umd.edu/you/students>.

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.

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" email address for every graduate student. All official UMD communications will be sent to students at their "@umd.edu" email address. Students are responsible for reading their @umd.edu 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 ($15/12 = 1.25$). 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 $2.5/3.0=83\%$ of a full-time load. 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.