

**COURSE SYLLABUS**  
**Master of Science Program in Applied Economics**  
**University of Maryland, College Park**  
**Washington, DC location: 1400 16th St, NW, suite 140**  
**ECON 645, Spring 2023**

Empirical Analysis III: Econometric Modeling and Forecasting

Class Meets: Monday 6:45-9:30pm (15 min break sometime between 7:45-8:30pm) at 1400 16<sup>th</sup> St. NW, suite 140

Instructor: Moises Yi

Email: moisesyi@umd.edu

Instructor Office Hours: Before and after class by appointment (students should contact the instructor at least 24 hours in advance to schedule an appointment).

TA: Tri Vu Phu (tvuphu@umd.edu)

TA Office Hours: Sunday 5-6pm (on Zoom)

Pre requisites: ECON 644

**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 of course/lecture structure:**

Lectures will be divided into two parts:

1. During the first hour and a half (6:45-8:15pm) we will hold a regular lecture (introducing new concepts and material). This lecture component will rely heavily on slides, all of which will be posted on ELMS.
2. The second part (8:30-9:30pm) will consist of either student presentations (more details on this below), or hands-on programming and Stata exercises (performed in small groups with my guidance). As you will see from the course schedule below, student presentations will take place roughly every other week. Weeks with no student presentations will be weeks in which we will work on hands-on programming in the second part of the class.

## **Textbooks and Software:**

Required:

- Introductory Econometrics: A Modern Approach, 7<sup>th</sup> 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 on the last page of this syllabus.

Recommended:

- Mostly Harmless Econometrics: An Empiricist's Companion, Angrist and Pischke (2009)
- Introduction to Econometrics by James H. Stock and Mark W. Watson, 4th Edition
- Microeconometrics using STATA, Cameron and Trivedi (2009)

## **Grading:**

- Midterm Exam: 30%
- Final Exam: 35%
- Problem sets 1-4: 15%
- Paper presentation: 10%
- Online Discussion Sessions: 10%

## **Midterm and Final Exams:**

Exams will take place on the dates listed on the schedule below. On the exam dates, we will meet at our regular time (6:45pm). I will provide you with instructions during the first 5 minutes. The exams will take 2.5-3 hours, each starting promptly at 6:50pm. I will be available to answer questions about the exams.

Both exams are cumulative and will consist of two sections: a theoretical/short question section and an empirical exercise section (which will require Stata).

It is your responsibility to make sure you are available on the exam dates.

**Problem Sets:**

The problem sets will include theoretical problems and empirical assignments. You will have 1-2 week(s) to solve each problem set. I encourage you to discuss the problems with your classmates. From my experience as a student, you can learn a great deal from your fellow students. However, after discussing problems, you should solve the problems on your own. Joint assignments will not be graded.

All problem sets are to be submitted electronically as STATA log files on ELMS and are due before class on Mondays at 6.45pm. Since answers are posted on ELMS right after the deadline, LATE submissions are not acceptable.

**Paper Presentations:**

Students in teams of 2-3 will choose one research paper that is related to one of the topics covered in the course. You will be able to sign up for specific slots online after our first lecture (a Google Sheet link will be posted on ELMS at 9:30pm on February 27<sup>th</sup> – it will work on a first-come first-serve basis).

Your job is to create a 15-20 minute presentation describing the paper, focusing the bulk of the time explaining what econometric techniques were used in their “main” regression, and if possible critiquing the technique used based on what we’ve covered in the course to that point. Presentations will be scattered throughout the course; please see the schedule below for more information on the dates. The entire class will watch the presentations and discuss their content during the second portion of the class (8:30-9:30pm, on the relevant Mondays).

You need to send me a draft of your slides no later than 8pm of the Thursday preceding your presentation due date. I will write back with feedback which should be incorporated into the final presentation, generally by Saturday evening.

**Online Discussions:**

I will post a question/series of questions relevant to the course material and/or student presentations every Wednesday at 9am. The discussion will be open until Friday at 1pm for you to comment/respond. I will check in once a day to participate/respond/redirect.

Please note that given our compressed schedule, online discussions play an integral part of the course. The online discussion component of the course will be graded on a scale of 0-10 points, which will account for 10% of your final grade. **Everyone is required to participate.** Non-participation will result in an automatic 1 point deduction (out of a total of 10 points) for each week you fail to participate.

**Final Course Grades**

Students’ grades on each component of the course will be weighed according to the scale above to calculate their numerical course grade. The 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

The grade A+ is reserved for the top student or two in the course (or maybe no one) – at the instructor’s discretion.

### Tentative Course Outline:

- Feb 27: Introduction, Endogeneity, Omitted Variable Bias, Instrumental Variables (Wooldridge Chapter 3.3, 9.4, 9.5, 15.1)
- Mar 6: Instrumental variables and 2SLS (Wooldridge Chapter 15.1-15.5; Mitchell 2010 Ch. 2, 3, and 9.3 (or Mitchell 2020 Ch. 2, 3,4 and 10.3))
- Mar 13: Panel Data I (Wooldridge Chapter 13, 14.1, Mitchell 2010 Ch. 5.1-5.7 (or Mitchell 2020 Ch. 6.1-6.7))
  - **(Pset #1 Due)**
  - Student presentations (2): IV
- **Mar 20: No class due to Spring Break**
- Mar 27: Panel Data II (Wooldridge Ch. 14.1-14.3, and Mitchell 2010 Ch. 5.8-5.15 (or Mitchell 2020 Ch. 6.8-6.15))
- Apr 3: Review + IV and Panel STATA exercises (Mitchell 2010 Ch. 6 (or Mitchell 2020 Ch. 7))
  - **(Pset #2 Due)**
  - Student presentations (1-2): Panel Data
- **Apr 10: Midterm Exam**
- Apr 17: Natural Experiments and Difference-in-Differences (Mitchell 2010 Ch. 7 (or Mitchell 2020 Ch. 8))
  - Student presentations (1-2): Panel Data
- Apr 24: Difference-in-Differences
- May 1: Limited Dependent Variables I (Wooldridge Ch. 7.1, 7.5, 17.1), including multivariate/dummy regression analysis and interpretation.
  - **(Pset #3 Due)**
  - Student presentations (1-2): Diff-in-Diff
- May 8: Limited Dependent Variables II
  - Student presentation (1-2): Probit/Logit
- **May 12: Intro to Time Series (Wooldridge Ch. 10-11)**
  - **Note this lecture will take place outside of regular schedule on a Friday (via Zoom).**
  - **(Pset #4 due – short problem set)**
- **May 15: Final Exam**

### **Other Standard Policies for the Program and the University of Maryland**

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.

**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.

**Course Website:** Copies of the course syllabus, student's grades, and other relevant links and documents will be posted on the course's ELMS/Canvas website. Students can access the site via [www.elms.umd.edu](http://www.elms.umd.edu). They will need to use their University of Maryland "directory ID" and password.

**Work Load:** 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 a given 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.

**Excused Absences:** If you miss any class meetings for any reason, it is your responsibility to work with 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'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. 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 free, comprehensive, and confidential counseling / mental health services that promote personal, social, and academic success. All Counseling Center services are completely free for enrolled students. Proactively explore the range of services available at the Counseling Center, including the Counseling Service and Accessibility and Disability Service 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>

**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.