

Empirical Analysis I: Foundations of Empirical Research

Syllabus

Instructor: Ye Zhang

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Office Hours: Thursdays 5:30PM-6:15PM, or by email appointment

Teaching Assistant: Mengyi Zhong

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Office Hours: Mengyi is supporting two sections of ECON643, our section and the PR01 section. She is hosting weekly 45-minute office hours for each section as follows. You are welcome to attend either of the weekly office hours although you are strongly encouraged to participate in the session that was intended for our own section of the course.

Sundays, 4:00PM-4:45PM (For our section PR02)

Mondays, 5:15PM-6:00PM (Primarily for section PR01)

Lectures and Sections

Each week there will be two synchronous online class meetings of 60 minutes each on Wednesday, from 6:45pm to 7:45pm and then from 8:00pm to 9:00pm. There will also be asynchronous class content each week such as student presentations and online discussions.

Course Description

This is the first course in the three-course sequence “Empirical Analysis”: ECON 643, ECON 644, and ECON 645, it provides students with a foundation for methods and applications used to conduct empirical research in economics. Main topics include probability theory, estimation and statistical inference, and an introduction to linear regression analysis. This course also introduces students to perform basic statistical analysis using STATA software.

This course requires a substantial amount of work outside the class. You are encouraged to form study groups and practice explaining concepts to each other. To succeed in this course, however, you will need to do the bulk of the work individually. You are expected to preview the material before each class, participate in online discussions and in lectures, review the material after class, and complete the assignments on time.

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, 5,6, and 7.

Textbooks and Software

The main required textbooks and software for the course are:

- 1) Anderson, Sweeney, Williams, Camm, Cochran, Fry, and Ohlmann (ASW), *Statistics for Business and Economics*, (14th Edition), Cengage, 2020.
- 2) Acock (A), *A Gentle Introduction to STATA*, (6th Edition), STATA Press, 2018.
- 3) STATA software, the last page of the syllabus provides detailed information on how to obtain STATA software.

Grading

Problem Set: 20% (Best Four out of Five)

Midterm Exam: 20%

Final Exam: 30%

Presentation: 10%

Data Project: 15%

Online Discussion: 5%

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 \Rightarrow A | 90 - 92 \Rightarrow A-

89-80 \Rightarrow B+ | 70-79 \Rightarrow B | 60-69 \Rightarrow B-

50-59 \Rightarrow C+ | 40-49 \Rightarrow C | 30-39 \Rightarrow C-

20-29 \Rightarrow D+ | 10-19 \Rightarrow D | 0-9 \Rightarrow F

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

Problem Sets

The problem sets will consist of both theoretical and empirical questions. A typical problem set will ask you to solve theoretical problems, generate descriptive statistics, and discuss the results. Your grade for the empirical part of the problem sets will depend on both whether or not you in fact estimate what you are asked to estimate and get the correct answer, and on how well you interpret your results. Both are valuable (and marketable) skills. In my experience, interpretation is more difficult to learn. The theoretical part of the problem sets may require you to do some calculations, or to explain the meaning of various statistical formulae.

As described in detail on the first page of each problem set, you must turn in both your clean and commented STATA log file and a completely separate set of answers to the problem set questions. The answers should consist of complete English sentences, possibly in addition to mathematical derivations or formulae and tables of your own creation. Generally, your problem sets should be typed. However, derivations and descriptive graphs may be done by hand. If you do this, you should scan your handwritten work and copy and paste into your main Word document. In my experience, neater and better organized problem sets receive higher grades, conditional on content. You are welcome to work together on the problem sets, but each student must turn in his or her own version of the assignment in their own words.

Problem sets should be turned in on ELMS. As solutions of problem sets will be posted online after due date and you are allowed to drop your lowest problem set grade, no late problem sets will be accepted for any reason.

Data Projects

Each student needs to participate in a data project for this course to build your empirical skills of working with various datasets. In groups of three students, you all will spend some time getting to know a published applied paper, organize and summarize the data appropriately, and perform some analysis of the data. Instructions and more details on the data project will be posted on ELMS.

Presentations

Students will work in groups of three to prepare and give a 15-minute presentation on the research paper you choose for the data project. The presentations should focus on the main research question of the paper, review the relevant economics literature, describe the data used to study the research question, and present empirical evidence related to the research question. An example presentation will be available in ELMS.

Students are required to submit a first draft of the presentation to me via email no later than 5PM the Friday preceding their presentations. I will provide you with initial feedback which should be incorporated into your final presentation. Final drafts of the presentation are due by 5:30 PM before the class on Wednesday.

Online Discussions

We will have asynchronous discussions of questions related to the materials covered in class online. On approximately 9 out of the 12 lecture weeks, I will post one or a series of questions to start our discussion on relevant course material. You are expected to post at least one and no more than three contributions to the online discussion during those weeks. I will post questions by 11:59 PM on Thursdays. The discussion will be open until Sunday at 11:59 PM for you to comment and respond. I will check in twice a day to read what's been posted, respond to some things, and redirect the discussion as necessary.

Tentative Course Outline

The class will meet on 12 consecutive Wednesday nights between March 3rd and May 19th with one exception: No class on Wednesday March 17th (spring break), and one Monday class from 6:45 pm - 9:00 pm on March 22nd.

Week	Date	Topics	Readings	Assignments
1	3/3/2021	Introduction and Descriptive Statistics I	ASW Chapters 1 and 2	
2	3/10/2021	Descriptive Statistics II and Introduction to STATA	ASW Chapter 3; A Chapters 1, 2, 3, and 5	Data Project Teams
3	3/22/2021	Introduction to Probability and Working with STATA Do-files	ASW Chapter 4; M Chapter 4	
4	3/24/2021	Probability Distributions	ASW Chapters 5 and 6	PS1 Out
5	3/31/2021	Sampling Distribution and Interval Estimation	ASW Chapters 7 and 8	PS1 Due; PS2 Out
6	4/7/2021	Hypothesis Tests and STATA Examples	ASW Chapter 9; A Chapter 7	PS2 Due; PS3 Out; Student Presentations
7	4/14/2021	Inference I and STATA Examples	ASW Chapter 10; A Chapter 7	PS3 Due; Student Presentations
8	4/21/2021	Midterm Exam (75 Minutes) and Inference II	ASW Chapters 11 and 12; A Chapter 9	
9	4/28/2021	Simple Linear Regression and STATA Examples	ASW Chapter 14; A Chapters 8 and 10	PS4 Out; Student Presentations
10	5/5/2021	Omitted Variable Bias and Multiple Regression	ASW Chapter 15; A Chapter 10	PS4 Due; PS5 Out
11	5/12/2021	Experimental Design and Final Exam Review	ASW Chapter 13	PS5 Due
12	5/19/2021 5/20/2021	Final Exam (120 Minutes) Data Project Report Due		

University of Maryland Policies

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

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".)

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.

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>

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>

Please note:

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 get yourself caught up in the course. 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 1:00PM 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 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, Learning Assistance Service, and the Testing Office, all described at <http://www.counseling.umd.edu/>.

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 week 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.

Academic Progress: The UMD 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 enrolled 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 have their enrollment in the program terminated 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.

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 a 15-inch screen. Screens smaller than 13 inches are probably not practical.

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

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.