ECON643–PR01: Empirical Analysis I: Foundations of Empirical Research

Fall 2020

Instructor: John Hao, Ph.D.
Email: johnhao@umd.edu
Lecture Times:

- Live lectures: Mondays, 6:45 p.m. – 7:45 p.m. and 8:00 p.m. – 9:00 p.m. via Zoom
- Pre-recorded mini lectures: available to watch on the course website

Office Hours: Mondays, 5:30 p.m. – 6:30 p.m. via Zoom or by appointment

Teaching Assistant: Mengyi Zhong
Email: myzhong6@umd.edu
Office Hours: Mengyi is supporting 3 sections of ECON643: PR01 and PR02 in DC and PWE1 in CP. She is hosting weekly 45-minute office hours for each section as follows. Students are welcome to attend any of the weekly office hours although you are strongly encouraged to participate in the session that was intended for your own section of the course.

- Mondays, 5:00 p.m. – 5:45 p.m., primarily for the Tuesday section in CP (PWE1)
- Tuesdays, 5:00 p.m. – 5:45 p.m., primarily for the Wednesday section in DC (PR02)
- **Fridays, 3:00 p.m. – 3:45 p.m., primarily for the Monday section in DC (PR01)**

Course Description

ECON643 provides students with a foundation for methods and applications used to conduct empirical economic research. Main topics include probability framework, basics of statistical inference including confidence intervals and hypothesis testing, and an introduction to linear regression analysis. You will learn how to work with economic data using Stata to apply the concepts you learn in practice. Upon completion of this course, you are expected to know how to use data to generate and interpret descriptive statistics, understand the probability framework that underlies statistical inference, perform basic statistical analysis using Stata, interpret statistical results correctly and communicate them professionally.

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.

This course is the first course in our program's 3-course Empirical Analysis sequence. This course is the pre-requisite for ECON644 Empirical Analysis II: Introduction to Economic Models, which is the prerequisite for ECON645 Empirical Analysis III: Econometric Modeling and Forecasting.

Course Objectives

The Master of Science in Applied Economics has 7 general learning outcomes: ability to (1) understand, evaluate and analyze economic data; (2) understand and interpret statistical evidence from economic data; (3) apply empirical evidence to assessing economic arguments; (4) apply macroeconomic theories to policy

discussions; (5) apply microeconomic theories to policy discussions; (6) communicate economic ideas to a broader audience; and (7) evaluate the effectiveness of policy programs using sound economic techniques. The learning outcomes that pertain to this course are: **(1), (2), (3), and (6)**.

Required Textbooks and Statistical Software

The following textbooks (SBE and AGIS) are a reliable reference for your studies during the whole course. It is strongly suggested that students read the corresponding book chapters before the lectures.

- SBE: Statistics for Business and Economics by Anderson, Sweeney, Williams, Camm, Cochran, Fry and Ohlmann, Cengage, 14th edition. ISBN-13: 978-1-337-90106-2.
- AGIS: A Gentle Introduction to Stata by Acock, Stata Press, 6th edition. ISBN-13: 978-1-59718-269-0.
- Stata, version 16. (See purchasing information on page 4 of the syllabus.)

Final Grade Evaluations

Composition and Weights:

Online Discussion	5%
Presentation	5%
Data Project	15%
Problem Set	20%
Midterm Exam	25%
Final Exam	30%
Total	100%

Grade Conversions:.

A+	98 – 10	A	93 – 97	A–	90 – 92	B+	80 – 89	B	70 – 79	B–	60 – 69
C+	50 – 59	C	40 – 49	C–	30 – 39	D+	20 – 29	D	10 – 19	F	0 – 9

Online Discussion: On every Thursday at 6 p.m. in 10 out of 12 lecture weeks, I will post one or a series of questions to start our discussion on the material that will be covered in the following lecture. You are expected to preview the readings assigned for the upcoming class and post **at least one and no more than three contributions** to the online discussion each week. The discussion will be open until Sunday at 6 p.m. for you to comment/respond. I will check in twice to participate/respond/redirect. The discussions will be graded according to a rubric posted on ELMS/Canvas website.

Presentation: Students will work in pairs to prepare and give a 10-minute presentation at some point during the course. If there is an odd number of students, one and only one group will have 3 members. There will be no more than 2 presentations in each of the 8 (out of 12) meetings. There will be no presentation on the following days: first meeting, second meeting, midterm exam, and final exam. The presentations will **focus on a research question** related to the students' idea for a course project, review the relevant economic literature, describe the data used to study the research question and feature two or

three graphs depicting some empirical evidence related to the research question. I will give an example presentation during the second meeting of the course. Presenters are required to send complete first drafts of their PowerPoint slides to me via email at johnhao@umd.edu by 5:30 p.m. on the Saturday before they present. I will reply with feedback by 5:30 p.m. on Sunday. The actual presentation must include revisions that address my feedback. Final drafts are due at the same email address by 5:30 p.m. before the class on Monday. Presenters can meet with me before class to discuss their presentation. The presentation will be graded according to a rubric posted on ELMS/Canvas website.

Data Project: To help you gain an appreciation for working with data, you will be asked to complete an applied project. In groups of 4 people, you will spend some time getting to know a popular dataset, identify a question of interest that can be addressed using that dataset and develop descriptive and statistical analysis. Details on the data project will be posted on ELMS/Canvas website.

Problem Set: There will be 4 problem sets. You are encouraged to discuss problem sets with your classmates, but you need to **complete and submit individual solutions in your own words**. Solutions will be posted on ELMS/Canvas website immediately at the due time and will be discussed in the class. Your answers need to be submitted electronically on ELMS/Canvas website.

Midterm Exam: The midterm exam will test everything covered in the course through the previous week. Part of the midterm exam will consist of a series of empirical problems to be solved using Stata. Answers need to be submitted electronically on ELMS/Canvas website.

Final Exam: The final exam is cumulative. Like the midterm, the final will include a series of empirical problems to be solved using Stata. Answers need to be submitted electronically on ELMS/Canvas website.

Other Information and Resources

Course Website: Copies of the course syllabus, slides, problem sets, 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.testudo.umd.edu` and for paying attention to messages I send to the class. 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 johnhao@umd.edu, rather than through the ELMS/Canvas messaging system, though I will reply to either kind of message.

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. Because we will use Stata throughout the course, students need to bring their laptop to every class, including exam dates.

Stata Purchasing Options: Students in our program are required to purchase Stata. Stata offers different products 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 a sufficient version for your coursework. With a single-user license, you can install

Stata on up to three computers. Descriptions of all the products are given here: http://www.stata.com/products/which-stata-is-right-for-me/.

You can obtain Stata at discounted rates through the Campus GradPlan, in which University of Maryland is a participating institution. To benefit from the discounted prices, click on the link and pick the Stata version you would like to buy. Through the Campus GradPlan, you can buy either an annual ($125 for Stata/IC via http://www.stata.com/order/new/edu/gradplans/campus-gradplan/) or a perpetual license ($225 for Stata/IC via 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 more than 12 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.

Terpware: While Stata is not available through Terpware, many other software packages are, including Microsoft Office suite which includes Microsoft Excel. Those packages are available for free or at a discount to University of Maryland students via Terpware: https://terpware.umd.edu/Windows/List/235.

Standard Policies for the Program and the University of Maryland

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 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.

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 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 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. Students who take 2 courses per quarter in our program complete 8 courses per year. Over the course of a year, taking 2 courses per quarter in our program is equivalent to 133% of a full-time load ($8/6 = 1.33$).

Academic Integrity: The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards applicable to all undergraduate and graduate students, and you are responsible for upholding these standards as you complete assignments and take exams in this course. Please make yourself aware of the consequences of cheating, fabrication, facilitation, and plagiarism. See https://www.studentconduct.umd.edu/academic-dishonesty for details.

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: https://policies.umd.edu/policy/9abcecc4-1d3a-41a1-8d50-033655a3d486/. 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.

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.

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/.

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). Since our program is an evening program in downtown Washington, DC, rather than a day program in College Park, we do not always cancel classes on the same days as the College Park campus. The program director will always 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.

Course Schedule

The following schedule is served as a course outline during the course.

Week	Date	Assignments	Topics	Readings
1	8/31		Introduction Descriptive Statistics: visual displays	SBE ch.1, 2
2	9/9	Data Project teams due	Descriptive Statistics: numerical measures Introduction and descriptive stats in Stata	SBE ch.3; AGIS ch.1, 2.1-2.3, 3.2, 3.5, 5
3	9/14	Problem Set 1 due	Introduction to Probability Stata Do-files and Log files	SBE ch.4; AGIS ch.4
4	9/21		Discrete Probability Distributions Continuous Probability Distributions	SBE ch.5, 6
5	9/28	Problem Set 2 due	Sampling and Sampling Distributions Interval Estimation	SBE ch.7, 8
6	10/5	Data Project 1 due	Hypothesis Tests Stata Examples	SBE ch.9; AGIS ch. 7.1-7.4, 7.7
7	10/12	Problem Set 3 due	Inference about Means with Two Populations Tests for One or Two Means Stata Examples	SBE ch. 10; AGIS ch. 7.6, 7.8-7.10
8	10/19		Midterm (75 minutes) Inferences about population variances Test of goodness of fit	SBE ch. 11, 12.3
9	10/26	Data Project 2 due	Introduction to Simple Linear Regression Sample Stata Session for Data Project 3	SBE ch.14; AGIS ch. 8
10	11/2	Data Project 3 due	Simple Linear Regression Omitted Variable Bias & Multiple Regression Regression exercises in Stata	SBE ch. 15; AGIS ch. 10.1-10.3
11	11/9	Problem Set 4 due	Practice problems	
12	11/16	Final Exam (2 hours)		
	11/17	Final Data Project Report Due		

Notes:

(1). Due to Labor Day holiday on Monday, 9/7, a makeup class will take place on **Wednesday, 9/9**.
(2). All assignments are due electronically by 6:45 p.m. on due dates. **NO** late submission will be accepted.