ECON 643: Empirical Analysis I: Foundations of Empirical Research
Fall 2016
Thursdays 6:45-9:15 pm, with a break from 8:00-8:15pm
Instructor: Christian A. Gregory
Office Thurs 5:30-6:30, other times by appt.
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TA: Hidehiko Matsumoto (goes by Hide -"Hee-Day")
email: DCmastersTA@econ.umd.edu
TA Office Hours: One day per week 3:00-7:00 p.m. (not the same day each week)
The schedule of TA office hours will be posted on the program's ELMS page.
Hide will also send weekly reminders about upcoming office hours every Sunday evening.

Overview. This course is an introduction to the methods and applications used to conduct empirical economic research. You will learn key concepts related to sampling, descriptive statistics, probability theory and application, confidence intervals, hypothesis testing, 2-sample t-tests, and regression analysis. You will be required to use `Stata` to apply these concepts to actual data.

Objectives. This is the first in a three-course series in empirical analysis required for the Masters in Professional Studies in Applied Economics. At the end of the course, you should be able to:

- Understand sampling methods and sampling distributions.

- Use probabilities and probability distributions to assess the likelihood of events.

- Use data to generate and interpret descriptive statistics.

- Understand, evaluate and analyze economic data and interpret statistical evidence from economic data.

- Apply empirical evidence to assessing economic arguments and communicate economic ideas to a broader audience.

- Demonstrate the ability to use `Stata` to analyze data.

- Estimate parameters of common discrete and continuous probability distributions.

- Understand the concept of hypothesis testing and conduct hypothesis tests using economic data.

- Calculate and interpret confidence intervals for population means and proportions.

- Estimate and interpret linear regressions and use regression results to make predictions.

Required Course Materials.

- **Required Textbooks.**

Statistics for Business and Economics. Anderson, Sweeney, Williams, Camm, Cochran. 13th edition. (Hereafter *ASW*.)

A Gentle Introduction to Stata. Acock, 4th or 5th edition. (Hereafter *AGIS*.)

- **Software.** 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/`

  You can obtain `Stata` at discounted rates through the Campus GradPlan, 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.

  `http://www.stata.com/order/new/edu/gradplans/campus-gradplan/`

  Through the Campus GradPlan you can buy either an annual (\$125 for `Stata/IC`) or a perpetual license (\$198 for `Stata/IC`). 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.

  If you wish to buy a 6-month license (\$75 for `Stata/IC`), you need to order it as a regular student using the following link:

  `http://www.stata.com/order/new/edu/gradplans/student-pricing/`

  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.

- **Microsoft Excel and Analysis ToolPak:** See

  `http://office.microsoft.com/en-us/excel-help/loadthe-analysis-toolpak-HP010021569.aspx`

  for download instructions.

- **Other.**

  - A good calculator for in-class exercises and exams.

- **Recommended Texts.** A good non-technical summary of statistics like *Statistics in Plain English*, 3rd Edition, T. Urdan.

- **Course Website:** If you are registered for this course, you can use your directory ID and password to access `myelms.umd.edu.` Copies of this syllabus, lecture notes, problem sets, and other relevant documents will be made available through the course website.

- **Prerequisites.** The program's standard admissions requirements include grades of at least B in introductory micro- and macroeconomics courses, and a grade of at least B- in an introductory calculus course. All students admitted to the Masters in Professional Studies in Applied Economics program should have satisfied prerequisites for this course.

Course Schedule

Course Schedule		
Date	**Class Material**	**Study Material**
9/1	Introduction to Statistics and Data, Intro to `Stata`, *.do files, and graphs	*ASW* Ch.1, 2. *AGIS* Ch.1, 2
9/8	Measures of Central Tendency, Dispersion; More *.do files, `Stata` commands	*ASW* Ch. 3. *AGIS* Chapter 3, 4, 5. **Problem Set 1 Distributed**.
9/15	Introduction to Probability	*ASW* Ch. 4. *AGIS* Ch 6.1, 6.2;
9/22	Discrete Probability Distributions, `Stata` macros, locals, scalars	*ASW* Ch. 5. **Problem Set 1 Due**.
9/29	Continuous Probability Distributions	*ASW* Ch 6.
10/6	**Midterm Exam** (75 mins)	Simulation with `Stata`, sampling distributions, `Stata` blog entries.
10/13	Sampling, Sampling Distributions, Interval Estimation	*ASW* Ch. 7, 8.
10/20	Hypothesis Tests of A Single Sample	*ASW*, Ch. 9, *AGIS* Ch. 7.1 - 7.5, 7.7 **Problem Set 2 Distributed**.
10/27	Hypothesis Tests of Two Samples, Inference About Variances	*ASW* Ch. 10, 11 *AGIS* Ch. 7.8.1.
11/3	ANOVA	*ASW* Ch. 13 *AGIS* Ch. 9.1-9.4
11/10	Correlation, Simple Regression, Residual Analysis	*ASW* Ch. 14; *AGIS* Ch. 8. **Problem Set 2 Due**, **Data Project Due.**
11/17	**Final Exam**	

Grades & Assignments. Grades will be determined according to the following distribution:

- **In-class Exercises** (10%): There will be several *unannounced* in-class exercises at the beginning of class. These exercises are meant to check your understanding of recently covered material. They will include calculations to be done "by hand" as well as exercises in `Stata`.

- **Online Discussions** (5%): Each week, we will have additional discussion of core concepts and applications that involve interaction between the instructor, each student, and classmates. These graded online discussions on topics that we discuss in class will take place in ELMS and be open each week on Tuesday morning. The weekly discussions will be open for your participation until midnight on Tuesday night.

- **Midterm** (20%) This exam will be 75 minutes in length. This will be an open book, open note exam.

- **Problem Sets** (25%): There will be two problem sets assigned throughout the semester. Problem set responses will be submitted electronically via ELMS prior to class on the designated due date (see below) and all work will be graded and returned electronically. Students are encouraged to consult with classmates in completing the problem sets. Students are allowed to give and receive help on the problems. However, students are NOT allowed to copy part or all of another student's problem set or allow another student to copy part or all of his/her own problem set.

- **Applied Econ Data Project** (15%) Students will use data of their choosing to do an analysis using the tools they have learned this semester. Students will come up with a question, explain its policy relevance, formulate an hypothesis to be tested, and show the results of their study in no more than 4 pages (including a maximum of 2 tables and 2 graphs). Students will work in groups for this project.

- **Final Exam** (25%): The final exam will be given on the last day of class (11/17) and will be 120 minutes in length. The exam will be a comprehensive, closed book exam covering ALL material discussed throughout the course, including lecture slides, textbook and other reading material, in-class assignments and problem sets. Students will be allowed to make up a 1-page (front and back) formula sheet that may be used during the exam.

- **Electronicly submitted work:** Electronically submitted work is submitted via ELMS, not via email.

Assignment and Exam Dates, Grade Values.

Assignment/Test	Assigned	Due	Points	Value
Problem Set 1	9/8	9/22	50	12.5%
Problem Set 2	10/20	11/10	50	12.5%
Midterm Exam	10/6	10/6	80	20%
Data Project	9/15	11/10	60	15%
Final Exam	11/17	11/17	100	25%
In-class Exercises	Varies		40	10%
Online Discussions	Every Week		20	5%
Total Points :			400	100%

Student-Faculty Interaction. Student attendance and participation during class as well as online for weekly discussions are essential for successfully completing this class. I will be available before class sessions for consultation and will provide virtual office hours by email and/or phone between class meetings.

Grading. Grades will be assigned according to the following distribution:

Letter Grade	Points Needed	Percent Needed
A	372	93%
A-	360-371	90%
B+	348-359	87%
B	332-347	83%
B-	320-331	80%
C+	308-319	77%
C	280-307	70%
D	240-270	60%
F	< 240	< 60%

Please note: The graduate school requires that students maintain a minimum GPA of 3.0 in order to maintain good academic standing. Students whose cumulative GPA falls below 3.0 are not making adequate progress in the program. Thus, a grade of B- or worse in this course is an indicator of inadequate progress in the program.

University of Maryland and Department of Economics Policies

Course Website: Copies of the course syllabus, your grades, and other relevant links and documents will be posted on the courses 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: Email is 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/apps/saddr/` AND for paying attention to messages I send to the class via ELMS. 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.

Contact Hours: In order to meet the requirements that the University of Maryland sets for student faculty content, students and faculty are required to participate in online discussions that are graded. (This makes up for the deficit of course hours in accelerating at 15-week course into 12 weeks.) Students are expected to participate in these conversations.

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 masters program is 3 courses per semester, or 6 courses per year.

Students who take 2 courses per quarter in our program complete 8 courses per year. So 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. For more information see `www.studenthonorcouncil.umd.edu.`

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.

Medical Excuses: 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 instructors 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 youre 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 youre 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). 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 programs ELMS/Canvas site. This will generally be done by 1:00 p.m. on days when weather or other factors are an issue.

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, and national origin. Reasonable accommodations will be made to students with documented disabilities. I will make every effort to accommodate students who are

registered with the Disability Support Services (DSS) Office and who provide me with a University of Maryland DSS Accommodation form.

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 programs director to petition the graduate school if they want to remain in the program. The petition must include a plan for getting the students 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.

Building Access: The door to the building at 1400 16th Street is unlocked on weekdays until 7:00 p.m. Students who arrive after 7:00 p.m. or on weekends will find the door locked. The buildings security guard is stationed at a desk just inside the door until 11:00 p.m. and will let you in. You can also call the phone on the security guards desk by dialing (202) 328-5158. If the security guard happens to be away from his or her desk when you arrive, you can pick up the black phone to the right of the door at 1400 16th Street. You will be connected to the company that handles security for our building. If you tell them you are with the University of Maryland, they should ask you for a password. The password is Drawbridge. When you tell them the password, they will be able to unlock the door for you.

Laptop Computer Requirement: Completing some of this courses 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.