Syllabus

ECON 424: Applied econometrics (section 0301) Spring 2019

Lecture	MW 3:30pm - 4:45pm in TYD 2111
Instructor	Kodjo Aflagah Office : Tydings Hall 3115B Email: aflagah@econ.umd.edu
Office hours	MW 5-6 pm or by appointment

Course Description and Objectives:

Econometrics applies modern statistical methods to economic problems. It introduces techniques for estimating the effect of one or more explanatory variables on a variable of interest. This course emphasizes on practical aspects of estimating econometric models of various types and tests of hypotheses. The objective of this course is to provide students with the knowledge and skills of basic applied econometrics including simple and multiple regressions using cross section, time series, and panel data, issues of multicollinearity, heteroskedasticity, serial correlation, models with binary dependent variable, and program evaluation.

Learning Outcomes:

- By the end of the semester, each student should be able to accurately do the following:
  - Formulate a single equation model appropriate for the data type, choose proper explanatory variables and functional forms, and use computer software to estimate the model.
  - Analyze and interpret the results of a regression (including coefficients, standard errors, t-ratios, p-values, R-squared, adjusted R-squared, and F-test results.)
  - Identify issues of heteroskedasticity, multicollinearity, and serial correlation and take appropriate actions to remove the issues.
  - Formulate and estimate models with binary dependent variables and interpret the results.
  - Use regression analysis to answer specific question regarding real world problems.

Prerequisites:

Restriction: Must be in a major within the BSOS-Economics department, BA track.

One course with a minimum grade of C- from (ECON305, ECON306, ECON325, ECON326); and one course with a minimum grade of C- from (ECON230, BMGT230, ECON321).

Students should be familiar with the following concepts: random variable, probability distribution, joint probability distribution, independence, expected value and its properties, variance, sampling distribution, statistical inference (hypothesis testing, confidence intervals), and regression.

Textbooks and other required technology:

You have to bring a laptop to problem solving sessions.

We will use Stata. You can buy Stata/IC. The least expensive version of Stata is six-month license for Small Stata which is available only for students:

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

There is no required textbook for this course. Instead, I provide **lecture notes** for each session and suggest chapters to be read for more detailed discussions from some extremely valuable text books.

There are three econometrics text books you may use, each offering a different level of difficulty and mathematical. The previous editions of these books are as valuable as the last editions, and are certainly less expensive.

[Easy] Studenmund: *Using Econometrics, a Practical Guide (*by: A. H. Studenmund, 6th edition; Pearson Education, Inc. 2011) offers an easy-to-read text with less mathematical content.

[Moderate] Stock and Watson: *Introduction to Econometrics* (by: James S. Stock and Mark W. Watson, 3rd edition; Pearson Education, Inc. 2010) offers an intermediate text of econometrics. It also offers many chapters that review probability and statistics.

[Advanced] Wooldridge: *Introductory Econometrics, A Modern Approach* (by: Jeffrey M. Wooldridge. 6th edition; Cengage Learning, 2015) offers an advanced comprehensive set of subjects covered in any undergraduate level econometrics course. The text is more mathematical-oriented than the other texts.

The following book is also recommended for more material in applied econometrics. Its approach is different than other text-books and focuses exclusively on discussing causal relationships.

Angrist and Pischke: Mastering Metrics, the Path from Cause to Effect (by Joshua D. Angrist and Jorn-Steffen Pischke, Princton University Press, 2015)

The following books are recommended as guides for using Stata. The instruction to use Stata will be provided.

Acock: *A Gentle Introduction to Stata* by: Alan C. Acock, 4th Edition; Stata Press 2014. [Earlier editions are acceptable. Note that some commands change in newer versions of Stata.]

Baum: *An Introduction to Modern Econometrics Using Stata* by: Christopher F. Baum; Stata Press 2006.

Policies

A full description of policies regarding academic integrity, code of student conduct, sexual misconduct, discrimination, accessibility, attendance, absences or missed assignments, students right regarding undergraduate courses, official UMD communication, mid-term grades, complaint about course final grades, copyright and intellectual property, final exams and course evaluations , and campus resources are available at: http://ugst.umd.edu/courserelatedpolicies.html.

A summary of some of the policies is as follows:

- Academic Integrity: Do not cheat! The University of Maryland, College Park has a nationally recognized *Code of Academic Integrity*, and makes sure to enforce it.
- Code of student conduct: Do not engage in disorderly or disruptive conduct! This is only one of 19 violations of rules of student conduct, and the most relevant one in classroom! If I see any disruptive conduct, I will do a range of reactions including reducing your grade for class participation, asking you to leave the classroom and reporting your behavior to student conduct office.
- Accessibility: UMD guarantees appropriate accommodations for students with disabilities. Any student with a disability needing accommodation must obtain documentation from the Disabilities Support Service in 0106 Shoemaker Building, 301 314 7682. In such cases, inform me of your needs at the beginning of the semester. If you need further clarification, the link to DSS is http://www.counseling.umd.edu/dss.
- Review the course schedule. If you know of an instance (for e.g. religious observance) that will cause you to miss class or an exam, discuss the absence with me **BEFORE** the end of the schedule adjustment period. I will ask you to provide me a hard copy of a note containing the information about the dates that you will miss classes, and the reason for it.
- Academic accommodations will be offered only for excused absences. An excused absence is an absence for which the student has the right to receive, and the instructor has the responsibility to provide, academic accommodation. The five valid excuses according to University policy are:
    - Religious observances
    - Mandatory military obligation
    - Illness of the student or illness of an immediate family member
    - Participation in university activities at the request of university authorities
    - Compelling circumstances beyond the student's control (e.g., death in the family, required court appearance).
- Absences stemming from work duties other than military obligation (e.g., unexpected changes in shift assignments) and traffic/transit problems do not typically qualify for excused absence.
- A **hard copy** of documents should be handed to me, even if you inform me of your valid excuse in email or in person. Look at the policy web page for the description of appropriate document.
- **If you miss an exam and cannot provide document for a valid excuse, your grade will be recorded as a zero**. If you can provide documents for a valid excuse, contact me to schedule make-ups as far in advance as possible by email and at a minimum the day of the exam.
- You have one week to do each assignment. For missed assignments to be considered as excused, you have to provide appropriate documents for the ENTIRE WEEK, not just the day the assignment is due. In the case of valid excuses, we will discuss proper academic accommodations.
- I will count only 90% of in-class quizzes. You need to provide documents for missed classes ONLY if you miss more than 10% of classes. In this case, you have to prove that you miss ALL classes due to legitimate excuses. In the case of valid excuses, we will discuss proper academic accommodations.

- Excused absences do not alter the academic requirements for the course. Students are responsible for information and material missed on the day of absence.
- The University has adopted email as the primary means for sending official communications to students. I prefer to be contacted via email for any academic issue. I will do my best to respond in timely manner. My reaction to your mails will be delayed when received outside business hours. You MUST indicate in the object of your mail the name of the course and sign your email with your full name.
- I look forward to receiving your feedback on the course, both during and at the end of the semester. In particular, as a student member of the University of Maryland, **you are responsible to participate in the evaluation of the course** through CourseEvalUM (www.courseevalum.umd.edu will be available starting two weeks before the last day of classes). Your feedback is an essential part of the program at the University. It will remain confidential.

Grading of Assignments:

- **Before-class quizzes:** 10%. Online. There is no make up for these quizzes. You have one week to do these quizzes. No late submission is accepted.

- **In-class quizzes during lecture sessions:** 5%. Not graded. You will receive full credit for this part if you hand in 90% of the quizzes. There is no make up for these quizzes.

- **In-class quizzes during problem-solving sessions:** 5%. Not graded. You will receive full credit for this part if you hand in 90% of these practices. There is no make up for these practices.

- **Homework assignments:** 20% (Four assignments, 5% each)
  The assignments are to be submitted on ELMS. If you miss an assignment deadline, your assignment grade will be knocked down to a maximum of 50% credit for 48 hours after the due date and 20% after that. You will have one week to do these assignments so if you have a legitimate excuse for not doing them on time, the documents should clearly mention that you should be excused for the entire week, not just the day that the assignment is due.

- **Exams:** (midterm: 25%, final exam: 35%)
  - Exams are mandatory.
  - Final exam will be comprehensive.

Grade Breakdown:

I use the following cutoff points:

Letter Grade	A-, A	B-, B, B+	C-, C, C+	D, D+	F
Percentage	90%+	80%-89.99%	70%-79.99%	60%-69.99%	59.99%-

The cutoff points for + and – are determined as follows:

$\geq$ 97% A+ ; $\geq$ 93% A+ ; $\geq$ 90% A-. $\geq$ 87% B+ ; $\geq$ 83% B+ ; $\geq$ 80% B- ; and so forth.

Tentative Course Outline:

Date	Topic	Assignments
1/28	Introduction	
1/30	Lecture 1: What do we mean when we talk about econometrics?	
2/04	Lecture 2: Simple regression analysis	
2/06	Problem solving 1	
2/11	Lecture 3: What are OLS estimators?	
2/13	Problem solving 2	
2/18	Lecture 4: Hypotheses testing	
2/20	Problem solving 3	HW 1 assigned
2/25	Lecture 5: Multiple regression analysis	
2/27	Problem solving 4	HW 1 due 2/26 at midnight
3/04	Lecture 6: Further issues in regression analysis	
3/06	Lecture 7: Nonlinear functional forms	HW 2 assigned
3/11	Problem solving 5	
3/13	Lecture 8: Qualitative explanatory variables	HW 2 due 3/12 at midnight
	March 17-24 : Spring break	
3/25	Problem solving 6: Regressions with qualitative explanatory variables	
3/27	**Review**	
04/01	**Midterm**	
04/03	Lecture 9: Regressions with qualitative dependent variables	
04/08	Lecture 10: Heteroscedasticity and serial correlation	
04/10	Problem solving 7	HW 3 assigned
04/15	Lecture 11 - Panel data	
04/17	Problem solving 8	HW 3 due 4/16 at midnight
04/22	Lecture 12: RCTs and program evaluation	
04/24	Problem solving 9	
04/29	Lecture 13: Time series analysis I	
05/01	Problem solving 10	HW 4 assigned
05/06	Lecture 14: Time series analysis II	
05/08	Problem solving 11	HW 4 due 5/7 at midnight
05/13	**Review**	

The final exam is scheduled by the University on Saturday, **May 18 1:30-3:30pm**. Consult this page for the schedule of final exams:
https://www.registrar.umd.edu/current/registration/exam%20tables%20spring.html