Econ 423 - Fall 2015 University of Maryland
Department of Economics

Economics 423
ECONOMETRICS II

Instructor	Professor Guido Kuersteiner TYD 3145, 301-405-3493, kuersteiner@econ.umd.edu http://www.econ.umd.edu/faculty/profiles/kuersteiner
Internet	Class URL: see elms.umd.edu
Time	Tue, Th: 11am-12:15pm, TYD 2108
Office Hours	Tue: 1-2pm, Th: 2-3pm
TA	Camila Galindo, email: galindo-pardo@econ.umd.edu Office Hours: M: 1-2pm W: 1:30-2:30pm

COURSE GOALS: This course looks beyond the linear regression model that is covered in introductory econometrics classes. Many economic data-sets do not satisfy the strong requirements for the linear regression model. Examples include labor force participation decisions, consumer choice between different brands of a product, and household income and consumption surveys stretching over several years (panel data). In this course more advanced statistical models are covered that are needed to analyze these types of data. Topics include discrete choice models (Logit and Probit), censored and truncated regression models, panel data models and instrumental variables methods. The emphasis of the course is on understanding the need for the various methods and being able to apply them to data and on interpretation of the results. The statistical software *Stata* is used to illustrate the models covered with actual data applications.

PRE-REQUISITES: Econ 422 or equivalent background (requires permission by instructor).

TEXTBOOK: Wooldrige, J.M. (2012) Introductory Econometrics – A Modern Approach. 5th Edition. Thomson South-Western.

This text is required. It comes with almost 100 data-sets that are used as examples during the course and will be the basis of homework assignments.

COMPUTER SOFTWARE: The problem sets will contain empirical exercises that require the use of statistical software. There are a number of software packages suitable for this purpose. The main software used in the course is Stata. A Stata tutorial will be provided and Stata commands will be covered and demonstrated during lectures. An open source (free!) alternative to Stata is a package called Gretl (http://gretl.sourceforge.net/). A third possibility is to use SAS, which is also free of charge for students (http://www.sas.com/en_us/software/university-edition/download-software.html). Stata and SAS are also available in the Computer Labs: http://www.oacs.umd.edu/ComputerLabServices.asp)

ADDITIONAL RESOURCES: Check the class web page for additional materials, problem sets etc. I will communicate by email sent to the class list to announce problem sets and solutions, class cancelations and make-up classes (in case of University closing) etc.

COMPLEMENTARY LITERATURE:

• R. J. Larsen and M. L. Marx, An Introduction to Mathematical Statistics and its Applications, Prentice Hall. This is an excellent text to review in more depth the statistical concepts presented in class and beyond. This is an undergraduate text, therefore very accessible.

• Angrist, Joshua D. and Jörn-Steffen Pischke (2009): Mostly Harmless Econometrics: An Empiricist Companion, Princeton University Press.

• Angrist, Joshua D. and Jörn-Steffen Pischke (2015): Mastering 'Metrics: The Path from Cause to Effect, Princeton University Press.

• Cameron, A Colin and Parvin K. Trivedi (2010): Microeconometrics Using Stata, Revised Edition, Stata Press.

• Stock, James H. and Mark W. Watson (2006) Introduction to Econometrics, Second Edition, Addison-Wesley: Boston, MA.

• W. Greene, Econometric Analysis, Prentice Hall. This is an advanced text (graduate level). In addition to the topics we will cover in class, it contains a number of additional topics that give you a flavor of the discipline. A good resource book.

• J. Wooldridge, Econometric Analysis of Cross Section and Panel Data. This is a graduate course level text book that covers the material of this course in greater detail and at a more advanced level.

COMPUTER ASSIGNMENTS: Homework problems that require the use of statistical software will be handed out periodically. Check the lab schedule to plan times when you can complete your assignment. Homework will be graded on a pass/fail basis.

PROBLEM SET DUE DATES:

	Handed Out	**Due**
PS1	Sep 15	Sep 22
PS2	Sep 29	Oct 6
PS3	Oct 20	Oct 27
PS4	Nov 17	Nov 24

Problem Sets will be posted online at the dates listed above. You will have one week to complete each assignment. Homework needs to be handed in **in class** on the dates listed in the table. Homework that is handed in late receives a grade of fail.

COURSE GRADING:

Homework	**10%**	**Due as listed above**
Midterm I	**20%**	**Oct 13 (in class)**
Midterm II	**30%**	**Nov 3 (in class)**
Final	**40%**	**Monday, Dec 14, 8-10am (subject to change)**

EXAM FORMAT: The midterm and final exams are closed book exams. All you need to bring to the exam is pen or pencil and a basic calculator. Any form of collaboration during the exams or use of unauthorized materials is strictly forbidden.

Collaboration on homework is allowed and encouraged. However, make sure you write up your answers individually (i.e. don't copy some else's homework verbatim).

Academic Integrity

The student-administered University Honor Code and Honor Pledge (shc.umd.edu/code.html) prohibits students from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents and forging signatures. On every examination students must write by hand and sign the following pledge,

"I pledge on my honor that I have not given or received any unauthorized assistance on this examination or assignment."

Compliance with the code is administered by the Student Honor Council, which strives to promote a community of trust on the College Park campus.

Copyright Protection for Class Materials

The lecture class and all other course materials that exist in a tangible medium, such as written or recorded lectures, Power Point presentations, handouts and tests, are copyright protected. Students may not copy and distribute such materials except for personal use and with the instructor's permission.

Attendance

By signing up for this class you agree to exam formats, course requirements and timing of exams and due dates of work to be handed in. Attendance in all lectures is expected.

University policies excuse the absences of students for

• illness,
• religious observances,
• participation in University activities at the request of university authorities and
• compelling circumstances beyond the student's control.

The University's policy on religious observance and classroom assignments and tests states that students should not be penalized for participation in religious observances and that, whenever feasible, they should be allowed to make up academic assignments that are missed due to such absences. **Students are responsible for notifying the instructor of projected absences within the first two weeks of the semester.** This is especially important for final examinations.

Multiple or prolonged absences, and absences that prevent attendance at a major scheduled grading event as noted under course requirements, will require either (i) written documentation from an appropriate health care provider/organization or (ii) advance notice in writing of a religious observance or University-sanctioned event. Make up exams and extensions of deadlines will be given only when the student has a University-recognized excused absence. If a major scheduled grading event must be missed for a legitimate reason, the student must contact the instructor **and the director of undergraduate studies** (Dr. Cindy Clement) prior to the scheduled date and time. If a major scheduled grading event is missed due to unforeseen circumstances on the scheduled date, the student (or family member/friend in extreme circumstances) must contact the instructor within 24 hours of the missed exam/deadline. Official documentation of the excuse must always be provided. If a student misses an exam or assignment deadline for any unauthorized reason or cannot provide acceptable documentation, he/she will receive a grade of zero. For information on the university's absence policy see:
http://www.umd.edu/catalog/index.cfm/show/content.section/c/27/ss/1584/s/1540

Students with Disabilities

UMD guarantees appropriate accommodations for students with disabilities. If you require accommodation, please contact me as soon as possible. If you need further clarification, the link to DSS is: http://faculty.umd.edu/teach/specialneeds.html

COURSE OUTLINE:

Part 0 - Introduction to Empirical Questions and Data

1. Some examples of empirical questions: W 1.2
2. Experimental versus Observational Data: W 1.3
3. Data Sources and Types: W 1.3
4. Causality: W1.3

Part I - Review of the Linear Regression Model

1. The Simple Linear Regression Model: W 2.1, 2.2
2. Sampling Distribution of the OLS Estimators: W 2.5, Summary of Chapter 2
3. Hypothesis Tests and Confidence Intervals for the Linear Regression Model: W 4.2, 4.3, 4.5

Part II – Instrumental Variables Regression

1. Motivation: Omitted Variables in a Simple Regression Model: W 15.1
2. IV Estimation of the Multiple Regression Model: W 15.2
3. Two Stage Least Squares: W 15.3
4. Two Stage Least Squares with Heteroskedasticity: W 15.6

Part III – Panel Data Methods

1. Policy Analysis with pooled Cross-Sections : W 13.1,13.2
2. Two Period Panel Data Analysis: W 13.3, 13.4
3. Differencing Panel Data: W 13.5
4. Fixed Effects Estimation: W 14.1
5. Random Effects Estimation: W 14.2

Part IV – Binary Response Models

1. Logit and Probit Models for Binary Response: W 17.1
2. Specifying Logit and Probit Models: W17.1
3. Maximum Likelhihood Estimation of Logit and Probit Models: W17.1 A C.4
4. Testing Multiple Hypotheses: W17.1
5. Interpreting the Logit and Probit Estimates W17.1

Part VI – Data with Corner Solution Responses

1. The Tobit Model: W 17.2
2. Interpreting Tobit Estimates
3. Specification Issues in Tobit Models

Part VI – Censored and Truncated Regression Models

1. Censored Regression Models: W 17.4
2. Truncated Regression Models: W 17.4
3. Sample Selection Correction: W 17.5

Part VII – Time Series Models (Time Permitting)