




Course ECON6306: Applied Econometrics
Professor Michael Tiefelsdorf
Term Fall Semester 2016
Lectures & Labs GR3.402 B – Thursdays, 4:00-6:45 pm

Contact Information

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 Please begin email subject lines with **ECON**.
Office Hours Tuesday 2:00 – 4:00 pm in my Office at GR3.204
 After class, by appointment or when my office door is open.
Other Information Please check the ELEARNING course site regularly for lecture notes, announcements etc.
Teaching Assistant None
Office Location Not available
Email Address Not available
Office Hours Not available


General Course Information

Pre-requisites, Co-requisites, & other restrictions This course has no official pre-requisites; however, it is assumed that graduate students have had a solid college-level introduction to statistics and basic calculus. We will not be using calculus beyond basic derivatives, though the instructor may demonstrate its use in some statistical and econometric arguments. An introduction to matrix algebra and calculations will be given.


A general understanding of computer use is expected. An introduction of the course software  and its econometric libraries will be provided.

Many – but not all – students will also have taken an undergraduate econometrics course. This course will apply some econometric arguments but econometric background knowledge is not required.

It is strongly recommended that you do a quick review of your old statistics and econometrics notes to keep up with this course.

Course Description The course focuses on the analysis of data, which were generated from a broad range of human activities. The objective is to build informative models, which allow us to test hypotheses related to the underlying data generating process. These models cover multiple linear regression and some of its extensions. Both practical data analytics skills and the conceptional comprehension of the underlying econometric methods is taught. The powerful statistical software environment  and its extensions is applied to perform informative data analyses.

Learning Outcomes *Upon completing this class, students will:*

- *Handle, explore and visualize data as well as perform statistical data analysis within the  environment*

- Understand the underlying concepts of multivariate linear regression analysis and some of its extensions
- Build informative multiple linear regression models
- Identify and overcome potential model violations
- Develop the capability to independently digest econometric literature including its use of basic matrix algebra
- Use the generalized linear model family to analyze binomial and Poisson distributed endogenous variables.

Required Texts & Materials

[Ham] Hamilton, Lawrence (1992). *Regression with Graphics. A second Course in Applied Statistics*. Duxbury Press.

Key chapters are 1-4 & 7.

Notes: [a] on a 2 hours reserve at UTD's Library; [b] used copies are available for instance at www.amazon.com (used ~\$20-\$60)

[KZ] Kleiber, Christian and Achim Zeileis (2008). *Applied Econometrics with R*. Springer Verlag.

Note: This textbook is available as free pdf-download at UTD's library.

Supplemental Texts, Readings & Materials

[LAN] Lander, J.P. *R for Everyone. Advanced Analytics and Graphics*. Addison Wesley, 2014. Check for instance www.amazon.com (new ~\$25)

Note: This textbook is available online at UTD's library but cannot be downloaded.

An excellent webpage that provides a concise introduction into data operations, graphics and statistical data analysis with R is <http://www.statmethods.net/index.html>

Additional documentation will be made available as required on the eLEARNING website.

Software

The free open source R-environment (see www.r-project.org) for Windows, Linux and Mac OS X computers.

We will be using this semester the enhanced version by Microsoft. More information on the installation of Microsoft's Open R (<https://mran.microsoft.com/download/>), the installation of several supporting packages, and the powerful development shell RStudio (<https://www.rstudio.com/home/>) will be provided during the first lecture.

Assignments & Academic Calendar

[Tentative Lecture Dates, Topics, Reading Assignments and Lab Dates]

Date	Topic	Reading	Assignments
Aug. 25	INTRODUCTION & INSTALLATION OF R & TYPESETTING OF EQUATIONS	Handouts LAN01-03	
Sep. 01	GETTING STARTED WITH R	Handout & KZ01-02 & LAN04-06	
Sep. 08	STATISTICS REVIEW I & R-OPERATIONS I	Handout &	Lab01

		LAN07-10	
Sep. 15	STATISTICS REVIEW II & R-OPERATIONS II & VARIABLE DISTRIBUTIONS	Handout & Ham01	
Sep. 22	BIVARIATE REGRESSION, VARIABLE TRANSFORMATIONS & ELASTICITY	Ham02 & LAN16	Lab02
Sep. 29	MULTIPLE REGRESSION I	Ham03 & KZ03	
Oct. 06	MULTIPLE REGRESSION II	Ham03 & KZ03	Lab03
Oct. 13	BASIC MATRIX OPERATIONS	Handout & Ham App3	
Oct. 20	REGRESSION DIAGNOSTICS	Ham04 & KZ04	Lab04
Oct. 27	MAXIMUM LIKELIHOOD PRINCIPLE (ML) & FEASIBLE GENERAL LEAST SQUARES (FGLS)	Handout	
Nov. 03	ACCOUNTING FOR SERIAL AUTOCORRELATION & HETEROSCEDASTICITY	Handout & KZ06	Lab05
Nov. 10	LOGISTIC REGRESSION	Ham07 & KZ05	
Nov. 17	GENERALIZED LINEAR MODEL (GLM)	Handout & KZ05	Lab06
Nov. 24	THANKSGIVING HOLIDAY		
Dec. 01	REVIEW SESSION		
TBA	FINAL EXAM		

Labs:

Lab	Topic
Lab01	Basic R Operations, Mathematical Typesetting, Probability and Statistical Hypothesis Testing Principle
Lab02	Bivariate Regression, Variable Transformations and Model Linearization
Lab03	Basic Multiple Regression Analysis, Interaction Effects and Categorical Regressors
Lab04	Matrix Algebra and Regression Diagnostics
Lab05	ML Principle, FGLS, Autocorrelation and Heteroscedasticity
Lab06	GLM, Logistic and Poisson Regression

Course Policies

Grading (credit) Criteria	Policies: <ul style="list-style-type: none"> Labs and the final exam need to be solved <i>individually</i>. Plagiarism <i>cannot</i> be tolerated. Participation is highly encourages but will not be graded. Engagement with the course material will lead to participation and indirectly to an increased comprehension of the course material. 				
	<table> <tr> <th>Requirements</th><th>Points</th></tr> <tr> <td>6 Labs @ 10 pts: labs should be handed in as hardcopies</td><td>60 pts</td></tr> </table>	Requirements	Points	6 Labs @ 10 pts: labs should be handed in as hardcopies	60 pts
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	<p><i>rather than by email. The labs will prepare you in parts for the final exam.</i></p> <p><i>Final Exam:</i> 40 pts</p> <p><i><u>Open book and open notes.</u> Bring a pocket calculator</i></p>
Late Work	<p>Work that is late by <i>one day</i> will lead to a deduction of 10% of its points.</p> <p>Work that is late by <i>two days</i> will lead to a deduction of 20 % of its points.</p> <p>Later work <i>cannot be accepted</i> unless special circumstances can be claimed.</p> <p>Preferably contact the instructor before the deadline if you think that you may need to hand your assignment in late.</p>
UTD Syllabus Policies	<p>All UTD syllabus policies apply to this course. It is advisable to study these policies at least once per academic year.</p> <p>See http://go.utdallas.edu/syllabus-policies for details</p>

These descriptions and timelines are subject to change at the discretion of the course instructor.