Course Objective:

The course objective is to provide students with a number of commonly used econometric tools and how they can be implemented in empirical research and practical applications. Emphasis will be placed on appreciating its scope, understanding the essentials underlying the various methods, and developing the ability to relate the methods to important issues. At the end of this semester, students will be able to use computer based statistical packages to analyze data, will understand how to interpret the output and will be confident to carry out independent analysis.

Prerequisites:

Applied multivariate data analysis I and II (QUMT 8310 and QUMT 8311).

Textbooks:

Main Textbooks:


Additional References:

A fantastic source with some mathematical explanations and empirical examples of all the built-in commands in Stata.  
http://www.stata.com/

Advanced graduate textbook that focuses on microeconometrics methods. Has an excellent description of various nonlinear models.

Starts with some basic econometric methods at the undergraduate level, but then covers more advanced topics in spatial correlation, panel data, limited dependent variables and time series using matrix algebra. Its main strength are the theoretical exercises at the end of each chapter.

This is a first-year graduate econometrics textbook at the level of Greene (2009). It is open source and it can be found at:  
http://www.ssc.wisc.edu/~bhansen/econometrics/

Intuitive and almost nontechnical discussion of the most commonly used econometric tools.

Has a broad coverage of topics that are more current than in Greene (2008). The author's website contains the data along with the Stata codes to replicate the exercises in the book.  

Focuses on the use of Stata and explains the most common microeconometrics models. Very useful to conduct applied research.

This is a classic textbook to start with applied econometric research. Each chapter is organized around a large applied literature, where the relevant economic theory is discussed along with the empirical facts and the econometrics.

**SOFTWARE:**

**Main Software:**

The Stata software will be used throughout. Stata is a powerful statistical program with a broad set of pre-programmed econometric and statistical tools. Versions 9 and later have
the MATA matrix programming language. MATA is similar to more flexible programming software like R, GAUSS or MATLAB. You will be required to work on a term paper and Stata may be necessary to conduct the project. I will go over some Stata tutorials and examples during lectures. However, you may use any other software packages you prefer for assignments or projects as long as they can perform required tasks.

Other Software:

GAUSS (www.aptech.com), MATLAB (www.mathworks.com) and Ox (www.oxmetrics.net) are high-level matrix programming languages with a variety of built-in statistical functions. Here you have complete control of your analysis, but you have to do most of the programming yourself. R (www.r-project.org) and gretl (www.gretl.sourceforge.net) are open source (free) software. The first is a very flexible statistical software that has a large amount of packages contributed by third parties (e.g. nonparametric, spatial, stochastic frontier.) gretl has many built-in procedures, mostly for time series. EViews (www.eviews.com), RATS (www.estima.com), LINDEP (www.lindep.com), TSP (www.tspintl.com) and SAS (www.sas.com) are other popular software with a variety of built-in procedures.

Empirical Project:

The empirical project should employ econometric tools covered in the course. Each student must submit a proposal by September 22. The proposal should include (1) the main question of interest (2) data sources and description, and (3) your suggested econometric models. The final version of the term paper is due the last day of classes. The paper should follow the structure of an empirical journal article, containing the following parts (i) abstract, (ii) introduction, (iii) description of the data, (iv) econometric model, (v) estimation results and interpretation, and (vi) conclusions. You may include additional output tables or computer codes in the appendix.

Exams:

There will be two non-cumulative exams; each will count 25% towards your final grade. You must have a valid University excuse in order to take a make-up exam.

Grading:

In addition to the two exams (25% each) and the term paper (20%), there will be two problem sets of 10% each and one in-class presentation (10%). No additional credit will be given. The cutoffs for the A-F grading system are given by:

- 90.00 – 100.0 ⇒ A
- 80.00 – 89.99 ⇒ B
- 70.00 – 79.99 ⇒ C
- 0.00 – 69.99 ⇒ F
Tentative Course Outline and Readings:

† Required reading; ‡ Suggested reading; * Empirical application; ○ General reference.

Part I. Basics of Regression Analysis

1. Carrying Out an Empirical Project. Sep 3
   Ch 1† (G); Ch 19† (W1); Ch 22‡ (K)

2. Linear Regression Models, OLS, Assumptions and Properties Sep 10, 17
   Ch 2,† 3,† 4† (G); Ch 2,† 3,† 5† (W1); Ch 4† (W2); Ch 4† (B2); Ch 3,‡ 4‡ (B1); Ch 3‡ (K)

3. Inference, Functional Forms, Specification and Prediction Sep 24
   Ch 5,† 6,† 7† (G); Ch 4,† 6,† 7,† 9† (W1); Ch 5† (K)

4. Additional Issues: Autocorrelation, Heteroskedasticity, and Multicollinearity Oct 1
   Ch 8,† 4.8,† 19† (G); Ch 8,† 12† (W1); Ch 5† (B1); Ch 8,† 10,† 12† (K)

Part II. Endogeneity, IV and System of Equations

5. Simultaneity and IV Estimation Oct 8
   Ch 12,† 13† (G); Ch 15† (W1); Ch 5† (W2); Ch 9† (K)


6. System of Equations Oct 15*

Ch 10,† 13† (G); Ch 16† (W1); Ch 7‡ (W2)


**Part III.** General Estimation Methods


Ch 11† (G); Ch 5‡ (C1)


Exam 1 (During class time) Nov 5

8. Generalized Method of Moments (GMM) and Minimum Distance Estimation Nov 12

Ch 15† (G); Ch 8,‡ 14‡ (W2); Ch 6† (C1)


9. Maximum Likelihood Estimation (MLE) and QMLE  

Ch 16† (G); Ch 13† (W2); Ch 5† (C1)  


**Part IV. Panel Data and Additional Topics**

1 We will cover panel data (topic 10) and based on the class interests we will cover one or two of the topics 11 through 14.


Ch 9† (G); Ch 13,† 14† (W1); Ch 12† (B1); Ch 18† (K); Ch 21† (C1)  


Ch 23† (G); Ch 17† (W1); Ch 15† (W2); Ch 13† (B1); Ch 16† (K); Ch 14,† 15† (C1)  


13. Censoring and Sample Selection Models. Dec 3

Ch 24† (G); Ch 17† (W1); Ch 16,‡ 17† (W2); Ch 17.3‡ (K); Ch 16‡ (C1)


14. Regression-Discontinuity Design. Dec 3


Presentations and Final Papers Due. Dec 10*

Exam 2 (5:45 p.m.–7:30 p.m.) Dec 17

**Learning Goals:**

<table>
<thead>
<tr>
<th>PhD Learning Goal:</th>
<th>This course contributes to the following PhD learning objectives:</th>
<th>Assessment method:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discipline knowledge</td>
<td>X</td>
<td>Exams</td>
</tr>
<tr>
<td>Advanced theoretical or practical research skills for the specialization</td>
<td>X</td>
<td>Term paper</td>
</tr>
<tr>
<td>Preparation for teaching responsibilities</td>
<td>X</td>
<td>Presentations</td>
</tr>
<tr>
<td>Dissertation competency preparation</td>
<td>X</td>
<td>Term paper</td>
</tr>
</tbody>
</table>
**Important University Dates:**

- Monday, August 31. First day of classes.
- Monday, September 7. Labor Day Holiday (no classes).
- Wednesday, September 16. Census day.
- Wednesday, November 18. Drop/Withdrawal deadline.
- Thursday, Nov 26 - Friday, Nov 27. Thanksgiving Holiday (no classes).
- Thursday, December 10. Study Day (no classes or exams).
- Friday, Dec 11 - Thursday, Dec 17. Final examinations.

**Mandatory Course Evaluation:**

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Online evaluations will be available Nov. 18 - Dec. 9, 2015. Students who complete their evaluations will have priority access to their grades.

**Available Assistance:**

If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu. Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

**Academic Integrity:**

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.
**Sexual Harassment, Discrimination, and Violence:**

In accordance with UT System regulations, your instructor is a responsible employee for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.