Course & Instructor:

Instructor: Dr. Diego Escobari  
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Phone: 956.665.3366  
Email: diego.escobari@utrgv.edu  
Web Page: http://faculty.utrgv.edu/diego.escobari/  
Office Hours: MT 3:00 p.m. – 5:00 p.m., and by appointment  
Lecture Time: R 4:40 p.m. – 7:10 p.m.  
Lecture Venue: Weslaco Center for Innovation and Commercialization 2.206

Course Objective:

The course objective is to provide students with the main methods of modern time series analysis. 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. Through readings, lectures, written assignments and computer applications students are expected to become familiar with these techniques to read and understand applied scientific papers. At the end of this semester, students will be able to use computer based statistical packages to analyze time series 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 (ISQM/QUMT 8310 and ISQM/QUMT 8311)

Textbooks:

Main Textbooks:

Additional References:

Classic reference for graduate time series econometrics.

A good modern forecasting textbook.

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

Used in Econometrics I. It has a whole section on time series econometrics.

Suggested in Econometrics I. Part 2 and Chapter 18 provide a good (less advance) treatment of time series methods.

This is a first-year graduate econometrics textbook at the level of Greene (2012). It is open source and it can be found at: [http://www.ssc.wisc.edu/~bhansen/econometrics/](http://www.ssc.wisc.edu/~bhansen/econometrics/)

This is a graduate time series econometrics textbook at the level of Hamilton (1994). It is open source and it can be found at: [http://faculty.chicagobooth.edu/john.cochrane/research/papers/time_series_book.pdf](http://faculty.chicagobooth.edu/john.cochrane/research/papers/time_series_book.pdf)

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 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 October 4. The proposal should include (1) the main question of interest (2) data description or how you will obtain it, 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.

In-class Presentation:

Each student should select a paper to present during class time. The paper needs to be related to one of the class topics, either being an empirical application or a methodological paper. Submit your paper to the class instructor for approval early in the semester to schedule the presentations. Note that there is a limited number of topics, so topics will be assigned on a first-come, first-serve basis. Prepare your presentations to be 30 minutes long, including questions.

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%, which includes a paper presentation during the last day of the semester), 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:
TENTATIVE COURSE OUTLINE AND READINGS:

† Required reading; ‡ Suggested reading; * Empirical paper; ◆ General reference.

1. Introduction  
   Aug 30
   Ch 1† (E); Ch 10‡ (W)

2. Difference Equations  
   Sep 6
   Ch 1† (E); Ch 1†, 2‡ (H)

3. Autoregressive and Moving Average Models, Stationarity, ARIMA Models  
   Sep 13
   Ch 2† (E); Ch 3† (H); Ch 8‡, 13‡ (D); Ch 3‡ (C)

4. Autocorrelation, Partial Autocorrelation Functions and Box-Jenkins  
   Sep 20, 27
   Ch 2† (E); Ch 4‡ (H); Ch 4‡ (C)

5. Modeling Volatility: ARCH, GARCH, ARCH-M, DCC-GARCH  
   Oct 4
   Ch 3† (E); Ch 16‡, 21‡ (H); Ch 14‡ (D)


6. Trends and Unit Roots, Dickey Fuller and Augmented Dickey Fuller Tests Oct 11

Ch 4\(^1\) (E); Ch 17\(^\ddagger\), 18\(^\ddagger\) (H); Ch 18\(^\ddagger\) (W); Ch 10\(^\ddagger\) (C)


Exam 1 (During class time) Oct 18

7. Intervention Analysis and Transfer Function Models Oct 18

Ch 5\(^\ddagger\) (E)

8. Vector Autoregression, Impulse Responses and Variance Decompositions

Ch 5† (E); Ch 11‡ (H); Ch 11‡ (D); Ch 15.1-15.4‡ (H2); Ch 5‡ (C)


9. Cointegration and Error-Correction Models

Ch 6† (E); Ch 19‡ (H); Ch 18‡ (W); Ch 15.8‡ (H2); Ch 11‡ (C)


10. Nonlinear Time Series Models

Ch 7† (E); Ch 22‡ (H)


11. Dynamic Panels

Ch 15‡ (G)


Presentations and Final Papers Due Nov 29

Exam 2 (5:45 p.m. – 7:30 p.m.) Dec 13
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:

The UTRGV academic calendar can be found at [http://my.utrgv.edu](http://my.utrgv.edu) at the bottom of the screen, prior to login. Some important dates include:

- **August 27**  First day of classes
- **August 30**  Last day to add a course or register for fall 2018
- **September 3**  Labor Day, no classes
- **November 14**  Last day to drop a course; will count toward the 6-drop rule
- **November 22 - 24**  Thanksgiving Holiday, no classes
- **December 6**  Study Day, no classes
- **December 7 - 13**  Final Exams
- **December 14 - 15**  Commencement Exercises

STUDENTS WITH DISABILITIES:

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact Student Accessibility Services (SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services.

PREGNANCY, PREGNANCY-RELATED, AND PARENTING ACCOMMODATIONS

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Accessibility Services for additional information and to request accommodations.
**Student Accessibility Services**

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 ability@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 ability@utrgv.edu.

**Mandatory Course Evaluation:**

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

- Oct. 4 – Oct. 10 – Fall 2018 Module 1
- Nov. 29 – Dec. 5 – Fall 2018 Module 2
- Nov. 15 – Dec. 5 – Fall 2018 (full semester)

**Scholastic 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 students 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.