Instructor: Tse-min Lin  
Office: BAT 4.144  
Office Hours: TTH 3:30-5:00pm and by Appointment  
Phone: 232-7248  
E-Mail: tml@austin.utexas.edu

**Course Objectives:**

This course is designed to examine the formal and statistical structure of a variety of techniques typically used to analyze dynamic processes, with an emphasis on the applications of these techniques in political science. Subtopics include difference equations; chaotic processes; stationary ARMA processes; persistent and/or nonstationary processes including integrated, fractionally integrated, and near-integrated processes; the estimation and forecasting of time series single equation regression and multi-equation systems; cointegration and error correction; Granger causality and vector autoregression; time-series cross-section methods; and modeling time dependence in binary data.

**Course Requirements and Grading Policy:**

In addition to regular homework assignments, you are required to write a research paper based on a statistical procedure introduced in this class. The topic of the paper is your own choice, but you should discuss your ideas with the instructor early in the semester to obtain his approval. By Week 12, you are required to turn in a paper proposal. You should work closely with the instructor in developing ideas, formulating models, acquiring data, and carrying out the analyses.

Homework Assignments (40%)  
Paper/Project Proposal (20%)  
Final Paper/Project (40%)

Note: Plus/minus grades will be assigned for the final grade.

**Required Texts:**


**Optional Texts:**

Useful Titles:


Students with Disabilities:

Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259. For more information, visit [http://www.utexas.edu/diversity/ddce/ssd/](http://www.utexas.edu/diversity/ddce/ssd/).

University Honor Code:

http://registrar.utexas.edu/catalogs/gi09-10/ch01/index.html

Accommodations for Religious Holidays:

By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

Emergency Evacuation Policy:

Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.
Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.

Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.

In the event of an evacuation, follow the instruction of faculty or class instructors.

Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.

Behavior Concerns Advice Line (BCAL): 232-5050
Emergency Information Web Site: http://www.utexas.edu/emergency

**Course Outline and Readings** (# Required; # Recommended)

Week 1: Overview


Week 2-3: Linear Difference Equations

## Enders, Chapter 1.

## Goldberg, Chapter 2, “Difference Equations.”

# Goldberg, Chapter 3, “Linear Difference Equations with Constant Coefficients.”


Optional Topic: Nonlinear Difference Equations and Chaos


Week 4-5: Univariate Stationary ARIMA Processes

## Enders, Chapter 2.
## Gujarati, Sections 22.2-22.8.


Week 6-7: Nonstationary Processes: Unit Roots

## Enders, Chapter 4.

Week 8: Nonstationary Processes: Fractional and Near Integration


Week 9: Spring Break

Week 10: Linear Time Series Regression Models

## Gujarati, Chapter 12.


Week 11-12: Cointegration and Error-Correction Models

## Enders, Chapter 6.

Approval.” *Political Analysis* 3: 51-87.


Week 13-14: Multiple Time-Series Models

## Brandt and Williams

## Enders, Chapter 5.

## Gujarati, Section 22.9.


Additional Optional Readings:


### Week 14-15: Time Series Cross-Section Models

## Gujarati, Chapter 16.


### Week 16: Modeling Time Dependence in Binary Data


