

# ECON 7801. ECONOMETRICS II

Fall 2019

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<b>Instructor:</b> Ivan Mendieta-Muñoz, Ph.D.	<b>Time:</b> TuTh, 2:00 p.m. - 3:20 p.m.
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## Contact information:

Office: Suite 4100, Office 4230, 260 Central Campus Drive, Gardner Commons.

Phone number (Economics office): (+1) 801-581-7481.

Consultation hours: Tu, 4:00 p.m. - 6:00 p.m.

[Personal website.](#)

[University website.](#)

**Course Page:** [Canvas](#)

**Prerequisites:** ECON 7800; or an equivalent background.

This assumes that students have a working knowledge in econometric theory, matrix algebra and multivariate calculus.

**Course Description and Objectives:** This course concentrates on time series applications. Its primary purpose is to introduce you to a variety of state-of-the-art estimation techniques used in empirical macroeconomic research. Emphasis is on hands-on implementation of the methods covered in the course. Topics include linear and nonlinear univariate and multivariate time series models; financial time series analysis; state-space models; practical issues with likelihood-based inference; computational approaches to hypothesis testing and model comparison; forecast evaluation; and structural identification. Estimation techniques for panel time series may also be handled if the time permits. The course will equip students with the necessary knowledge to be able to undertake econometric analysis of the type commonly associated with modern macroeconomic research.

## Textbook References:

- \*Enders, Walters. (2015). *Applied Econometric Time Series*. New York: Wiley. 4th Edition.
- Favero, Carlo. (2001). *Applied Macroeconometrics*. Oxford: Oxford University Press.
- Hamilton, James. (1994). *Time Series Analysis*. Princeton: Princeton University Press.
- Hayashi, Fumio. (2000). *Econometrics*. Princeton: Princeton University Press.
- Kim, Chang-Jim and Nelson, Charles R. (1999). *State-space Models with Regime Switching. Classical and Gibbs sampling Approaches with Applications*. Cambridge: The MIT Press.
- Lütkepohl, Helmut. (2005). *New Introduction to Multiple Time Series Analysis*. Berlin: Springer.

- Stock, James and Watson, Mark. (2015). *Introduction to Econometrics*. Westford: Pearson. 3rd Edition.

Readings outside these texts may also be assigned.

Students are also encouraged to keep up with current economic news. *Financial Times*, *New York Times* and *Wall Street Journal* are excellent sources and they are free on campus. You may also want to peruse *The Economist*. Additionally, an excellent website where you can find op-ed pieces by leading economists is *Project Syndicate*.

### University Policies:

1. **The Americans with Disabilities Act.** The Department of Economics at the University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you need accommodations in this class, reasonable prior notice needs to be given to the instructor and to the Center for Disability Services (162 A. Ray Olpin Student Union Building, 581-5020 (V/TDD)) to make arrangements for accommodations (more information can be found [here](#)). All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.
2. **University Safety.** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. More information regarding safety and to view available training resources (including helpful videos) can be found [here](#).
3. **Addressing Sexual Misconduct.** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).
4. **Undocumented Student Support.** Immigration is a complex phenomenon with broad impact—those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit the [Dream Center website](#).

**Exams and Grading Policy:** The course grade will be based on three homework assignments; a final exam; and a final research paper submitted at the end of the semester. Therefore:

## Homework Assignments (30%) + Final Exam (35%) + Final Research Paper (35%)

The final research paper needs to be an econometric project of the student's own design. It could be an exercise in applying econometric techniques to some economic, social or financial issue amenable to empirical testing. It must be a time series application.

Your final report should be typewritten and follow conventional footnoting and bibliographic rules. It should be between 10 and 12 pages long, double-spaced. Papers more than 12 pages lose points. Your paper should briefly review the relevant literature. It should define measurable versions of the variables of interest and fit them into an econometric specification. It should apply appropriate estimation techniques, reporting the results clearly and concisely; and it should discuss the inferences that are justified from your results. Please do not include raw computer output.

There will be no make-up exams and late assignments will not get credit except in the cases of:

1. *Medical emergencies.*
2. *Officially sanctioned University activities.*
3. *Religious obligations.*

As indicated in PPM 9-7 Sec 15, the appropriate unit should provide a written statement for the reason of absence. In cases 2 and 3, students should get in touch with me at least one week before the exam and reschedule the examination. Students will not be assigned extra credit work to improve their grades. Senior class students' work will not be graded differently.

Grading system follows the university standards:

- Excellent, superior performance: A (90-100%), A- (85-89.9%)
- Good performance: B+ (80-84.9%), B (75-79.9%), B- (70-74.9%)
- Standard performance: C+ (65-69.9%), C (60-64.4%), C- (55-59.9%)
- Substandard performance: D+ (50-54.9%), D (45-49.9%), D- (40-44.9%)
- Unsatisfactory performance: E (0-39.9%)

**Important dates:**

Homework Assignment #1 .....	Thursday, September 19
Fall Break .....	Sunday-Sunday, October 6-13
Homework Assignment #2 .....	Tuesday, October 24
Homework Assignment #3 .....	Thursday, November 14
Discussion of Research Papers #1 .....	Thursday, November 21
Discussion of Research Papers #2 .....	Tuesday, November 26
Thanksgiving Break .....	Thursday-Sunday, November 28-December 1
Revision Session .....	Tuesday, December 3
Final Research Paper .....	Tuesday, December 10
Final Exam .....	Tuesday, December 10, 1:00 p.m. – 3:00 p.m.

**Class Rules:**

1. I encourage student cooperation in homework assignments. However, each student must present her own assignment. Duplication of the same assignment under different names is not acceptable and is considered cheating. Cheating in homework assignments or exams and other types of academic misconduct will be dealt with in accordance with the University regulations. Full details on procedures and penalties can be found [here](#). Punishments can be severe, so don't do it.
2. No electronic submissions will be accepted. You must hand in a hard copy of your assignments (either a manuscript or a printed document).
3. Come to class in time.
4. Read the assigned material in advance and familiarize with the subject before the lecture.
5. I will use Canvas for announcements, homework assignments, posting extra readings, etc. However, Canvas is not a substitute to attending class. It is your responsibility to keep up with the class.
6. Turn off your cell phones and remove them from your desk.
7. Do not believe any of the material you read in the textbooks or elsewhere. Learn it well and critically.
8. Do not believe any of the material I present in class. Learn it well and critically.

**Course Outline:** The following outline is approximate. We may slow down or speed up in accordance with the needs and demands of the class.

**1. Univariate Time Series Analysis**

## (a) Stationary Time Series Models

- ARMA models
- Stationarity, Invertibility and Ergodicity
- The Autocovariance-Generating Function
- Model Selection and Estimation
- Principles of Forecasting

## (b) Non-Stationary Time Series

- Trend and Difference Stationary Series
- Unit Root Non-Stationarity Tests
- ARIMA Models
- Time Series Decomposition Methods

**2. Multivariate Time Series Analysis**

## (a) VAR Models

- Model Selection and Estimation
- Innovation Accounting and Granger Causality

- Structural Identification: SVAR Models

(b) VEC Models

- Cointegration and Error Correction
- Short-run and Long-run Dynamics
- Estimation
- Structural Identification: SVEC Models

(c) ARDL Models

### 3. **Non-linear Time Series Models**

(a) Non-Linearity in Econometric Models

(b) Structural Change

(c) TAR and STAR Models

### 4. **Financial Time Series Analysis**

(a) Modeling Heteroskedasticity

(b) ARCH and GARCH Models

### 5. **State-Space Models**

(a) Specification

(b) The Kalman filter and the Likelihood Function

(c) Filtering and Smoothing

(d) Estimation of Linear State-Space Models

(e) TVP and MS Models

