FLORIDA ATLANTIC UNIVERSITY

COURSE CHANGE REQUEST
Graduate Programs

Department Economics

College College of Business

UGPC Approval _____
UFS Approval _____
SCNS Submittal _____
Confirmed _____
Banner _____
Catalog _____

***Current* Course Prefix and Number**	ECO 6424	***Current* Course Title**	Topics of Econometrics

*Syllabus must be attached for **ANY** changes to current course details. See Guidelines. Please consult and list departments that may be affected by the changes; attach documentation.*

Change title to:

Change prefix

From: **To:**

Change course number

From: **To:**

Change credits*

From: **To:**

Change grading

From: **To:**

Academic Service Learning (ASL) **

Add ☐ **Remove** ☐

* Review Provost Memorandum
** Academic Service Learning statement must be indicated in syllabus and approval attached to this form.

Change description to:

Change prerequisites/minimum grades to:
Prerequisite: ECO 6426 Advanced Econometrics

Change corequisites to:

Change registration controls to:

Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.

Effective Term/Year for Changes: Summer / 2022

Terminate course? Effective Term/Year for Termination:

Faculty Contact/Email/Phone

Approved by		***Date***
Department Chair	Monica Escaleras	1/11/22
College Curriculum Chair		1/13/22
College Dean	Ken Johnson	1/13/22
UGPC Chair		
UGC Chair		
Graduate College Dean		
UFS President		
Provost		

Email this form and syllabus to UGPC@fau.edu 10 days before the UGPC meeting.

ECO 6424 - 002
CRN: 10138
Topics in Econometrics:
Time Series Analysis
Summer 3, 2020
Class: Online Course
Class Meeting: Remote Meeting

Professor Information

Name: Ky Yuhn
Office: Barry Kaye Hall #151
e-mail: yuhn@fau.edu
Phone: (561) 297-3224

Office Hours

W: 1:30 p.m. – 4:30 p.m. on Canvas (Discussion)

Required Text and Materials

Walter Enders, *Applied Econometric Time Series* (4th ed.), 2018, New York, NY: John Wiley & Sons

Ky Yuhn, *Time Series Analysis* (Lecture Notes), 2020, Florida Atlantic University

The lecture notes (Coursepack) will be posted on Canvas. The Coursepack consists of six parts.

Recommended Text and Materials

Introductory Level

Jeffrey Wooldridge, *Introductory Econometrics: A Modern Approach* (4th ed.), 2012, South-Western.

Intermediate Level

Richard Harris and Robert Sollis, *Applied Time Series Modeling and Forecasting*, 2005, John Wiley &Sons

Advanced Level

John Campbell, Andrew Lo, and A. Craig Mackinlay, *The Econometrics of Financial Markets*, 1997, Princeton University Press

William Greene, *Econometric Analysis* (7th ed.), 2012, Prentice Hall

Course Description

This course is designed to present the latest developments in time series analysis and panel data methods such as SUR (seemingly unrelated regression), random walks, martingales, unit roots, cointegration, error correction models, GARCH, EGARCH, GARCH-M models. Panel data methods also constitute an important part of this course, and fixed effects and random effects models will be discussed in depth. This course also deals with some

applied econometric topics which include intervention analysis, impulse response functions, causality tests and VAR models. Some special topics such as Heckman's two-step method, regime-switching models (or Markov-switching models), time-varying regression, and bootstrapping will be explored in this course.

Course Prerequisites and Credit Hours

Prerequisites: ECO 6426 or permission
Credit hours: 3

Course Learning Objectives

The objective of this course is to expose students to the latest developments in time series analysis and panel data methods. The main feature of this course may be found in its application-oriented approach. This course follows the pattern established in my Advanced Econometrics course by emphasizing how econometric techniques can be applied to real-world problems encountered in economics, finance, accounting and other business fields. The economic implications and relevance of econometric models will be stressed throughout the course. Mathematical derivation and statistical proof are not emphasized. It is important to recognize that one can learn applied research methods only by "doing." Thus, computer applications are an integral part of this course. Prior course work in matrix algebra and differential calculus is helpful, but not essential.

Course Resources

The material in the class concentrates on lecture notes (Coursepack), which are the primary learning source.

Course Requirements and Evaluation Method

The course requirements include the following four elements:

(1) Exams: There will be one midterm exam and the final exam. The midterm exam will be given at 9:00 a.m. until 12:00 noon on July 17 (F), and the final exam will be given at 9:00 a.m. until 12:00 noon on August 7 (F).
(2) Reading Assignments and Problem Sets: I'll give you reading assignments based on the Coursepack and a problem set each week. There will be a total of 5 problem sets. The reading assignments and problem sets will be posted on Canvas. The problem set is designed to evaluate your understanding of the subjects covered by the Coursepack.
(3) Computer projects: There will be 10 computer projects. The topics of the computer projects will be posted on Canvas.
(4) Research paper: You are required to write a research paper. Your research paper should be sophisticated in methodology and original in content. You should utilize the econometric techniques you learn in this course. You can choose your own research topic.
(5) Discussion sessions: There will be a Discussion session on Canvas every Wednesday from 1:30 p.m. to 4:30 p.m.

The course evaluation is based on the following course components:

Midterm exam:	20%
Final exam:	20%
5 Problem sets:	20%
10 Computer projects:	20%
Research paper:	20%

The overall course grade will be based on the following distribution:

A:	92.5% and above; A-: 90.0 – 92.4%
B+:	87.0 – 89.9%; B: 83.0 – 86.9%; B-: 80.0 – 82.9%
C+:	77.0 – 79.9%; C: 73.0 – 76.9%; C-: 70.0 – 72.9%
F:	69.9% and below

Additional Course Policies

Missing Exams

If you miss any exam for religious reasons or any other acceptable reasons such as emergencies, health, family issues, you should request rescheduling the exam in writing at least two days before the exam.

Late Assignments

Late assignments will not be accepted except for the acceptable excuses described above.

Attendance Policy

Attendance is essential for the successful completion of the course, but it does not constitute part of the final grade.

Anti-plagiarism Software

Written components of any assignment or project may be submitted to anti-plagiarism software to evaluate the originality of the work. Any students found to be submitting work that is not their own will be deemed in violation of the University's honor code discussed above.

Course Outline

Weeks Topics

1, 2 **Part 1. Foundations of Regression Analysis**

1. The Method of Least Squares (LS): OLS and GLS
2. Simultaneous-Equations Models
   (1) Simultaneous Equations and Endogenous Variables
   (1) Simultaneous-Equation Bias and Inconsistency
   (2) Reduced-Form Equations and Indirect Least Squares (ILS)
   (3) Instrumental-Variable (IV) Estimation
   (4) Two-Stage Least Squares (2SLS) Estimation
3. Testing for Parameter Stability and Model Robustness
   (1) Tests for Structural Change
      -Chow Test
      -Dummy-Variable Approach
      -Recursive Estimation and CUSUM and CUSUMSQ Tests
   (2) Specification Analysis
      -Ramsey's RESET (Regression Specification Error Test)
      -Hausman's Specification Test

2, 3 **Part 2. Parameter Estimation beyond LS: Maximum Likelihood (ML) and GMM**

1. The Method of Maximum Likelihood (ML)
2. The Generalized Method of Moments (GMM)

3 **Part 3. Combining Cross-Sectional and Time Series Data**

1. Pooled Regression
2. Multivariate Regression Models
3. Seemingly Unrelated Regression (SUR)

Midterm Exam: July 17 (Fri.), 9:00 a.m. – 12:00 noon.

4 **Part 4. Regression with Panel Data** (***Optional***)

1. Balanced and Unbalanced Panel Data
2. The Fixed Effects Model (FEM)
3. The Random Effects Model (REM)
4. Hausman's Specification Test for Fixed versus Random Effects

5 **Part 5. The Box-Jenkins Method**

1. Stationary versus Nonstationary Processes
2. The Autocorrelation and Partial Autocorrelation Functions
3. Stationary Time Series Models: AR(p), MA(q), ARMA(p,q) Processes
4. Nonstaionary Time Series Models: ARIMA(p,d,q) Processes
5. Seasonality in Time Series Data

5 **Part 6. Time Series Models with Trend**

1. Unit Roots and Stationary Processes: (1) Martingale Processes; (2) Random Walks
2. Trend-Stationary versus Difference-Stationary Processes
3. The Dickey-Fuller Tests and Augmented Dickey-Fuller Tests
4. The Phillips-Perron Tests
5. Panel Unit Root Tests

5 **Part 7. Cointegration and Error Correction Models**

1. Integrated Variables and Cointegration
2. Engle-Granger's Residual-Based Cointegration Tests and Augmented Engle-Granger Cointegration Tests
3. Johansen's Maximum Likelihood Cointegration Tests
4. Cointegration and Error Correction Processes

6 **Part 8. Modeling Volatility**

1. Autoregressive Conditionally Heteroskedastic (ARCH) Processes
2. Generalized ARCH (GARCH) Models
3. ARCH-M, GARCH-M Models
4. MA-ARCH, MA-GARCH Models
5. MA-ARCH-M, MA-GARCH-M Models
6. Second-Generation ARCH Models: EGARCH, TARCH, APARCH, FIGARCH

6 **Part 9. Estimation of Dynamic Causal Effects**

1. Intervention Analysis
2. Event Studies
3. Causality Tests
4. Vector Autoregressive (VAR) Models and Impulse Response Functions (IRF)
5. Distributed Lag Models: The Koyck Lag Model

Part 10. Further Topics in Econometrics (*Optional*)

1. Heckman's Two-Step Method
2. Regime-Switching Models (Markov-Switching Models)
3. Time-Varying Regression
4. Monte Carlo, Bootstrapping, and Jackknife

FINAL EXAM: August 7 (Fri.), 9:00 a.m. – 12:00 noon

Selected University and College Policies

Code of Academic Integrity Policy Statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

Disability Policy Statement

In compliance with the Americans with Disabilities Act (ADAAA), students who require reasonable accommodation due to a disability to properly execute coursework must register with Student Accessibility Services (SAS)—in Boca Raton, SU 133, (561-297-3880); in Davie, LA 131 (954-236-1222); or in Jupiter, SR 110, (561-799-8585)-- and follow all SAS procedures. Their website is: https://fau.edu/sas

Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services—individual counseling, support meetings, and psychiatric serives, to name a few—offered to help improve and maintain emotional well-being. For more information, go to http://www.fau.edu/counseling/

Religious Accommodation Policy Statement

In accordance with rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices **and beliefs with regard to admissions, registration, class attendance and the scheduling of** examinations and work assignments. For further information, please see FAU Regulation 2.007 at http://www.fau.edu/regulations/chapter2/Reg%202.007%208-12.pdf

University Approved Absence Policy Statement

In accordance with rules of the Florida Atlantic University, students have the right to reasonable accommodations to participate in University approved activities, including athletic or scholastics teams, musical and theatrical performances and debate activities. It is the student's responsibility to notify the course instructor at least one week prior to missing any course assignment.

College of Business Minimum Grade Policy Statement

The minimum grade for College of Business requirements is a "C". This includes all courses that are a part of the pre-business foundation, business core, and major program. In addition, courses that are used to satisfy the university's Writing Across the Curriculum and Gordon Rule math requirements also have a minimum grade requirement of a "C". Course syllabi give individualized information about grading as it pertains to the individual classes.

Incomplete Grade Policy Statement

A student who is passing a course, but has not completed all work due to exceptional circumstances, may, with consent of the instructor, temporarily receive a grade of incomplete ("I"). The assignment of the "I" grade is at the discretion of the instructor, but is allowed only if the student is passing the course. The specific time required to make up an incomplete grade is at the discretion of the instructor. However, the College of Business policy on the resolution of incomplete grades requires that all work required to satisfy an incomplete ("I") grade must be completed within a period of time not exceeding one calendar year from the assignment of the incomplete grade. After one calendar year, the incomplete grade automatically becomes a failing ("F") grade.

Withdrawals

Any student who decides to drop is responsible for completing the proper paper work required to withdraw from the course.

Grade Appeal Process

A student may request a review of the final course grade when s/he believes that one of the following conditions apply:

- There was a computational or recording error in the grading.
- Non-academic criteria were applied in the grading process.
- There was a gross violation of the instructor's own grading system.

The procedures for a grade appeal may be found in Chapter 4 of the University Regulations.

Disruptive Behavior Policy Statement

Disruptive behavior is defined in the FAU Student Code of Conduct as *"... activities which interfere with the educational mission within classroom."* Students who behave in the classroom such that the educational experiences of other students and/or the instructor's course objectives are disrupted are subject to disciplinary action. Such behavior impedes students' ability to learn or an instructor's ability to teach. Disruptive behavior may include, but is not limited to: non-approved use of electronic devices (including cellular telephones); cursing or shouting at others in such a way as to be disruptive; or, other violations of an instructor's expectations for classroom conduct.

Faculty Rights and Responsibilities

Florida Atlantic University respects the right of instructors to teach and students to learn. Maintenance of these rights requires classroom conditions which do not impede their exercise. To ensure these rights, faculty members have the prerogative:

- To establish and implement academic standards
- To establish and enforce reasonable behavior standards in each class
- To refer disciplinary action to those students whose behavior may be judged to be disruptive under the Student Code of Conduct.