

# ECON 490 J3B: Economic Forecasting

University of Illinois at Urbana-Champaign  
College of Liberal Arts & Sciences  
Department of Economics

Collin Philipps  
David Kinley Hall 215

Spring 2018  
2:00-3:20pm Monday & Wednesday

## Communication:

**Course website:** Lecture notes, sample codes, and problem sets will be distributed through Illinois Compass 2G (<https://compass2g.illinois.edu/>). The website will automatically upload student rosters.

## **Collin Philipps (Instructor)**

**Office:** DKH 15

**E-mail:** [cphili6@illinois.edu](mailto:cphili6@illinois.edu)

**Office Hours:** Monday & Wednesday 3:20pm-4:50pm, and/or by appointment. There will be extra office hours before exams.

## Course Description:

This course provides an overview of modern, quantitative, statistical and econometric methods for forecasting and evaluating forecasts. Topics include linear regressions; modeling and forecasting trend and seasonality; characterizing and forecasting cycles; MA, AR, and ARMA models; forecasting with regressions; evaluating and combining forecasts; unit roots; stochastic trends; ARIMA models; and smoothing. Advanced topics such as volatility measurement, modeling, and forecasting will be covered if time permits. Students will be required to write code in one of several software environments commonly used for forecasting.

Credits: 3 hours (Undergraduate)/4 hours (Master)

Prerequisites: Students are assumed to have taken ECON202, ECON203 (Economic Statistics 1 and 2) or equivalent statistics and econometrics courses. Knowledge about basic calculus is also required.

## Course Format:

The instructor will give lectures on major concepts and issues and have classroom discussions when necessary. Students will be asked to do problem sets and produce forecasts using the tools taught in class.

## Course Objectives:

- To provide understanding of basic forecasting methods.
- To provide hands-on experiences of economic forecasting using real data.

## Learning Resources:

### *Textbooks:*

Diebold, *Forecasting in Economics, Business, Finance and Beyond*.

Diebold, *Elements of Forecasting*. (4e)

Students can access both at <http://www.ssc.upenn.edu/~fdiebold/Textbooks.html>, the author's website, for free.

### *Statistical software*

You need to use computer software to do forecasting based on simulated and actual data. The software we will use in class is **Eviews**, which has packaged statistical and econometric tools we need for forecasting. It is easy to use. Students can obtain a free "Lite" version at

<http://www.eviews.com/EViews9/EViews9SV/evstud9.html>

Any version you obtain should be appropriate for the course.

### *Supplementary Reading*

Eviews User's Guide, which comes with the Eviews software. You will find this document very useful.

## Student Assessment:

### *Scoring*

	[3 credits]	[4 credits]
• Assignments	400 Total Points	400 Total Points
• Midterm Exams	300 Total Points	300 Total Points
• Final Exam	300 Total Points	300 Total Points
• Final Project	n/a	300 Total Points

There will be five assignments, two midterm exams, and a final exam. Four-credit students will have to complete a final project. Your final grade for the class will be scored out of 1000 points for 3-credit students and 1,300 points for 4-credit students.

## Assessment Policies

### *Assignment Policy:*

There will be *five* assignments, roughly one every two weeks except on exam dates and breaks. All assignments are to be turned in at the beginning of the class in which they are due. Only the *best four out of the five* assignments will be counted toward the final grade (the assignment portion of your grade will be the average of all your assignment scores with the lowest assignment grade dropped). **Late assignments will not be accepted.**

### *Exam Policy:*

In the event that a student misses exams, the instructor reserves the right to give the student a zero on that exam. **There will be no make-up exams except per university policy.**

The following materials are allowed for use during the exam: graphing calculator, accounting calculator or four-function calculator. No books, notes, papers, or other documents are allowed while exams are being taken. Cell-phones or other items that connect to the Internet are also forbidden. Students found to be using unapproved items are in violation of the Academic Integrity policy of the University and will be subject to disciplinary action.

**Important Dates:**

Midterm Exam 1: Feb 28 in class

Midterm Exam 2: April 11, in class

Final Exam: To be determined (During final exam period)

All the exams are comprehensive.

Exam dates and times are *not* flexible. The only exception to this rule is a death in the family or illness requiring immediate attention from a physician. See Article 1 - Student Rights And Responsibilities (for more details on these issues at: [http://www.admin.illinois.edu/policy/Code/article1\\_part5\\_1-501.html](http://www.admin.illinois.edu/policy/Code/article1_part5_1-501.html)). The final exam conflict policy of the University will be enforced. The University's final exam policy is available at: [http://studentcode.illinois.edu/article3\\_part2\\_3-201.html](http://studentcode.illinois.edu/article3_part2_3-201.html)

**Topics:**

- Review of basic statistics and econometrics concepts; Introduction to Eviews
- Modeling and forecasting trend; Modeling and forecasting seasonality
- Characterizing cycles
- Modeling cycles: MA, AR, and ARMA models
- Forecasting cycles
- Forecasting with regression models
- Evaluating and combining forecasts
- Unit roots, stochastic trends, ARIMA forecasting models, and smoothing
- Volatility measurement, modeling and forecasting

If time permits, additional topics may be covered according to the interest of students.

**Emergency Response Recommendations:**

The university maintains guidelines for emergency responses. A list of recommendations when to evacuate and when to find shelter are available at:

[http://illinois.edu/cms/2251/general\\_emergency\\_response\\_recommendations\\_8\\_16\\_13\\_final.docx](http://illinois.edu/cms/2251/general_emergency_response_recommendations_8_16_13_final.docx)

Floor plans for specific buildings are available at:

<http://police.illinois.edu/emergencyplanning/floorplans/>

**Statement on Accommodations:**

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak Street, Champaign, call 333-4603 (V/TTY), or email a message to [disability@uiuc.edu](mailto:disability@uiuc.edu).

**Academic Integrity:**

“The University has the responsibility for maintaining academic integrity so as to protect the quality of education and research on our campus and to protect those who depend upon our integrity.

*Expectations of Students.* It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Students have been given notice of this Part by virtue of its publication. Regardless of whether a student has actually read this Part, a student is charged with knowledge of it. Ignorance is not a defense.”

The University’s full academic integrity policy is available at:

[http://studentcode.illinois.edu/article1\\_part4\\_1-401.html](http://studentcode.illinois.edu/article1_part4_1-401.html)

**List of Topics by Date:**

Day 1 (1/17): Introduction, review.  
Day 2 (1/22): Review of Prob. And Stat.  
Day 3 (1/24): Review of Prob. And Stat, Linear Reg.  
PS 1 is distributed. Due on 2/07.  
Day 4 (1/19): Introduction to Eviews for Linear Regression.  
Day 5 (1/31): Modeling Trend.  
Day 6 (2/05): Modeling Trend, Model selection (AIC/BIC, R2).  
Day 7 (2/07): Modeling Seasonality.  
Day 8 (2/12): Modeling Seasonality, Characterizing Cycles.  
Testing for seasonality (Wald test), Autocovariance.  
PS 2 is distributed, due 2/21.  
Day 9 (2/14): Modeling Cycles.  
Partial autocovariance function, sample covariance.  
Day 10 (2/19) Interpretation of sample ACF/PCF functions. Lag operators.  
Day 11 (2/21) Derive moments of AR(1) process.  
Day 12 (2/26) Review for Exam 1.  
Day 13 (2/28) **Exam 1.**  
Day 14 (3/05) AR processes, stationarity.  
PS 3 distributed, due 3/14.  
Day 15 (3/07) Prediction from AR(1) process, stochastic trend.  
Day 16 (3/12) AR(p) autocorrelation, partial autocorrelation.  
Day 17 (3/14) MA(1) process.  
(Spring Break 3/19, 3/21)  
Day 18 (3/26) MA(q) process, ARMA(p,q) process. Godfrey, DW tests.  
PS 4 distributed, due 4/04.  
Day 19 (3/28) Wold theorem and general linear process.  
Day 20 (4/02) Wold theorem.  
Day 21 (4/04) Yule-Walker.  
Day 22 (4/09) General Linear Process prediction.  
Day 23 (4/11) **Exam 2.**  
Day 24 (4/16) Wold, Review.  
Day 25 (4/18) Vector autoregression. Granger causality.  
Day 26 (4/23) Vector Autoregression lab session.  
PS 5 distributed, due 5/02.  
Day 29 (4/25) Volatility.  
Day 30 (4/30) Volatility, nonlinear models.  
Day 31 (5/02) "Endnote".  
(5/03) Reading Day, Extra Office Hours.  
**(Final Schedule TBD)**