Syllabus
ECON 3313: Elementary Economic Forecasting
Spring 2019

Instructor:	Rui Sun (rui.sun@uconn.edu)
Office Hours:	TuTh 1:30pm - 2:30pm, OAK 307
Lectures:	TuTh 11:00am - 12:15pm and OAK 109
Prerequisite:	ECON 2202 or 2212Q; STAT 1000Q or 1100Q
Recommended Preparation:	ECON 2311

Course Description:
This course provides an upper-level undergraduate introduction to forecasting, broadly defined to include all aspects of predictive modeling, in economics and related fields. Although we will make heavy use of (and assume significant background in) general econometrics/statistics, this course is much more sharply focused. It explicitly and exclusively about economic prediction, or forecasting, as opposed to general econometrics/statistics, or anything else. Emphasis will be on forecast construction, evaluation, and combination (point, interval, density). Mathematics of econometrics will be introduced only as needed and will ***not*** be a central focus.

Course Webpage:
Supplementary course materials will be provided on HuskyCT. Students should check this page regularly.

Course Materials:
There is no required textbook for this course, however, the following readings are recommended:

- Diebold, F. X., *Forecasting in Economics, Business, Finance and Beyond*, Department of Economics, University of Pennsylvania.
- Ghysels, E. and Marcellino, M., *Applied Economic Forecasting using Time Series Methods*, Oxford University Press.
- Diebold, F. X., *Elements of Forecasting*, 4th Edition, Cengage Learning.
- Stock, J. and Watson, M., *Introduction to Econometrics*, 4^{th} Edition, Pearson.

In addition to the recommended textbooks, a series of lecture notes which follow the material presented in class will be posted on HuskyCT. The recommended textbooks and lecture notes are complements to the lectures, not substitutes.

Statistical Software:
We will use the statistical package R which is free and open source.

Requirements:
Assessment of this course will be based on the following four components:

- Participation: You are expected to attend class regularly. Periodically throughout the classes, you will be asked to complete pop quizzes (will not be graded) without notice. No makeups for the pop quizzes.
- Homework Assignments: A set of problem sets including computer exercises will be assigned during the semester. These assignments are designed to re-enforce course material, prepare you for exams, and emphasize practical applications of quantitative methods. The assignments will require use of statistical software. While cooperation and discussion is encouraged, homework assignments, including computer work, must be the work of the student whose name appears on them (i.e., your own). Homework will be collected at the beginning of the section on the due date.
- Midterm Exams: There are two in-class midterm exams. Dates are TBA.
- Final Exam: The final exam is scheduled by the University.

Grading:

- Option 1: participation (10%) + homework (20%) + two midterms (20% + 20%) + final (30%)
- Option 2: participation (10%) + homework (20%) + best midterm (30%) + final (40%)

The higher score between those two options will be used to decide your letter grade. I will generally follow the following grading scheme, however, I reserve the right to make adjustments as necessary. You will be notified if adjustments are made.

≥ 93.00	A	$73.00 - 76.99$	C
$90.00 - 92.99$	$A-$	$70.00 - 72.99$	$C-$
$87.00 - 89.99$	$B+$	$67.00 - 69.99$	$D+$
$83.00 - 86.99$	B	$63.00 - 66.99$	D
$80.00 - 82.99$	$B-$	$60.00 - 62.99$	$D-$
$77.00 - 79.99$	$C+$	≤ 59.99	F

If the class average on the final grades falls below 83, a curve will be added to bring the class average up to 83. For example, if the class average is 80, then a 3 curve will be added to bring the class average up to 83. The **class average** of this course is guaranteed to correspond to the lowest B.

Cheat Sheets:
Two pages (single sided, 8.5×11 inches) are allowed for each midterm exam and four pages for the final exam. They can either be printed or handwritten.

Makeup Exam Policy:
Only students with legitimate excuses will be allowed to make up missed exams. The date and time for student to take a makeup exam will be arranged on a case by case basis.

Academic Integrity:
You are responsible for acting in accordance with the University of Connecticut's Student Code. Review and become familiar with these expectations. In particular, make sure you have read the section that applies to you on Academic Integrity. Cheating and plagiarism are taken very seriously at the University of Connecticut. As a student, it is your responsibility to avoid plagiarism.

Disabilities and Accommodations:
In compliance with the University of Connecticut policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for students with disabilities. Students in need of accommodations should go to the center for students with disabilities to verify their eligibility for appropriate accommodations. If you are eligible for accommodations such as extra time during exams, please provide documentation and coordinate with me no later than a week prior to every exam.

R and RStudio:
R is a programming language and free software environment for statistical computing. To install RStudio, first download and install R from http://cran.r-project.org/. Second, download and install RStudio by visiting http://rstudio.org/download/desktop and clicking the link listed under "Recommended for Your System." While not required, these references may be useful if you need some extra help learning R, or want to go beyond the material covered in the course:

- Contributed Documentation by Comprehensive R Archive Network (CRAN): comprehensive list of freely available reference material for R.
- R Twotorials by Anthony Damico: ninety energetic, two-minute video tutorials on statistical programming with R.
- Google Developers R Programming Video Lectures: R Programming video tutorials from beginning to advanced.
- Econometrics in R by Grant Farnsworth.
- Resources to help you learn R by UCLA Academic Technology Services: a wealth of information about R, conveniently arranged in one place. The R Starter Kit is particularly helpful.
- R in a Nutshell by Joseph Adler: it provides a comprehensive reference guide to R.
- R-bloggers: a blog aggregator for R news and tutorials, with lots of applications.

Tentative Course Outline:

Topic
1. Introduction to Forecasting a) Forecasts and decisions b) The object to be forecast c) Forecast types d) The forecast horizon e) The information set f) Methods and complexity
2. Review of Probability, Statistics, and Regression for Forecasting a) Regression as Curve Fitting b) Regression as a Probability Model c) A Typical Regression Analysis d) Regression From a Forecasting Perspective
3. Forecast Model Building and Use a) Cross-Section Prediction b) Wage Prediction Conditional on Education and Experience
Exam One
4. Trend and Seasonality a) Deterministic Trend b) Deterministic Seasonality
5. Characterizing Cycles a) Covariance Stationary Time Series b) White Noise c) The Lag Operator d) Wolds Theorem (General Linear Process) e) Estimation and Inference
Exam Two
6. Modeling Cycles: MA, AR and ARMA Models a) Moving-average (MA) Models b) Autoregressive (AR) Models c) Autoregressive Moving Average (ARMA) Models
7. Forecasting Cycles a) Optimal forecasts b) Forecasting moving average processes c) Making the forecasts operational d) The chain rule of forecasting
8. Noise: Conditional Variance Dynamics a) Extensions of ARCH and GARCH Models b) Estimating, Forecasting and Diagnosing GARCH Models
9. Assembling the Components a) Serially Correlated Disturbances b) Lagged Dependent Variables
Final Exam