

Economic Forecasting
Economics 144
UCLA Spring 2020

Syllabus

Lecturer: Dr. Randall R. Rojas
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Time and Location

Tuesday and Thursday 9:30AM-10:45AM, Perloff 1102

Course Description

This course provides a survey of the theory and application of time series methods to forecasting in Economics, Business, and Government. Topics covered include modeling and forecasting trend, seasonality, and cycles. We will also discuss stochastic trends, volatility measure, and evaluation of forecasting techniques. This course presents a hands-on approach to real-world data analysis methods that are widely used by economists and other professionals.

Textbook:

(a) *Forecasting for Economics and Business*. Gloria Gonzales-Rivera. Pearson, 2013.

Data: http://wps.prenhall.com/bp_gonzalez_forecasteb_1/221/56733/14523894.cw/index.html

(b) *Forecasting in Economics, Business, Finance and Beyond..* 2017 Edition. Francis X. Diebold.

Available for free (digital version) at: <http://www.ssc.upenn.edu/~fdiebold/Teaching221/Forecasting.pdf>

(c) *Forecasting: Principles and Practice* Rob J Hyndman and George Athanasopoulos. 2nd Ed.

Available for free (digital version) at: <https://otexts.com/fpp2/>

Prerequisites

Economics 101 and 103/103L. Familiarity with a data analysis software (e.g., R, Excel, Matlab, STATA, etc.) and/or programming experience.

Computation of Course Grade

The course grade will be based on homework assignments, group projects, two midterm exams, and a cumulative final exam. Formula sheets will be provided during the exams. Missed exams and projects may not be made up.

- 20% Group Projects (Two projects, 10% each)
- 15% Homework (~5 Assignments, 3% each)
- 25% Midterm Exam (Chapters: 1-11, May 7th)
- 40% Final Exam (Cumulative, Thursday, June 11th, 8:00AM-11:00AM)

Course Enforced Policies

- There are no make-up exams. Exam dates are indicated on the syllabus. Therefore, if you cannot take an exam on the specified date, you are advised to take the course in a different section.
- You need to bring a valid form of picture ID on scheduled days of exams. You will not be allowed to take the exam without one.
- The use of electronic devices such as cellphones, tablets, and devices that allow you to communicate with others, is strictly banned. You will be reported for cheating if caught using them during exams. Therefore, please turn off all your electronic devices during exams.
- There are no extra credit assignments available.
- All grades are final when filed by the instructor on the Final Grade Report.

Assignment Enforced Policies

- Homework and project answers must be provided in the order in which they are asked on the respective assignment. If they are not in order, you will be deducted 25% of the total points for the respective assignment.
- Homework and projects must be typed, unless there are analytical questions, in which case, the answers to these questions may be hand written. I would encourage you to use R Markdown and/or L^AT_EX.
- There are no make up projects or homework assignments. All projects/assignments are due on the scheduled due date. Late and/or emailed solutions for projects or homework assignments will not be accepted. No exceptions will be made on this.
- Both projects and homework solutions must be submitted with the respective R code. Therefore, incomplete project and/or homework solutions (e.g., missing the respective R code), will not receive any credit.
- You are advised to start working on the assignments as early as possible in order to have enough time to troubleshoot any R issue(s) you may encounter.
- Although I encourage you to work together on the homework assignments, you must submit your own solution for each one.

R Tutorials/Reference Materials

- Note: You can use either R or RStudio (both are free) the only difference between them is the platform on which you write/run your codes.
- <http://stats.idre.ucla.edu/r/>
- <http://cran.r-project.org/doc/manuals/R-intro.pdf>
- <https://bookdown.org/ccolonescu/RPoE4/>
- On the course website I will also be posting additional reference materials as needed in class.

Tentative Course Schedule

Week	Lecture Topics	Chapters
1 (Mar 31, Apr 2)	Introduction to Forecasting of Time Series	1 ^a , 2 ^a , 4 ^b , 4 ^c
	Time Series Graphics and Statistics	2 ^c , 3 ^a , 3 ^c , 4 ^a
2 (Apr 7, 9)	Modeling and Forecasting Trend	5 ^b
	White Noise	2 ^c
	Homework 1 (Apr 9)	
3 (Apr 14, 16)	Modeling and Forecasting Seasonality	2 ^c , 5 ^b , 6 ^c
	Homework 2 (Apr 16)	
4 (Apr 21, 23)	Modeling and Forecasting Cycles	6 ^a , 7 ^a , 8 ^a , 6 ^b , 7 ^b
	Models with Trend, Seasonal and Cyclical Components	9 ^a , 9 ^b
	Project 1 (Apr 23)	
5 (Apr 28, 30)	Forecasting with Regression Models.	11 ^a , 16 ^b
	Homework 3 (Apr 30)	
6 (May 5, 7)	Evaluating and Combining Forecasts.	12 ^a , 12 ^b , 13 ^b , 14 ^b
	Midterm Exam (May 7)	
7 (May 12, 14)	Stochastic Trends, ARIMA Forecasting Models, and Smoothing	7 ^c , 8 ^c , 9 ^c , 10 ^a , 13 ^b
8 (May 19, 21)	Volatility Measurement, Modeling and Forecasting	13 ^a , 14 ^a , 8 ^b
	Homework 4 (May 21)	
9 (May 26, 28)	Temporal Aggregation Models (THIEF and MAPA)	Lecture Notes
	Homework 5 (May 28)	
10 (June 2, 4)	Advanced Methods	Lecture Notes
	Project 2 (June 4)	
11 (June 11)	Final Exam (Thursday, June 11, 8:00AM-11:00AM)	Cumulative

Note: a = Textbook 1 (Gonzales-Rivera) and b = Textbook 2 (Diebold).

Note: c = Textbook 3 (Hyndman & Athanasopoulos).