

Course Outline

Department of Economics
School of Business and Economics

ECON 4330-3
Forecasting in Business and Economics (3,0,0)

Calendar Description

Students apply a variety of forecasting methods to solve problems in business and economics. Topics include qualitative forecasting methods; the forecasting process, data considerations, and model selection; moving averages and exponential smoothing; multiple regression and time series decomposition; Box-Jenkins methodology to fit autoregressive conditional heteroscedasticity (ARCH); time-varying volatility and autoregressive integrated moving average (ARIMA) and vector autoregressive models; combining forecasting results; and implementing forecasting.

Educational Objectives/Outcomes

Upon completing this course, students will be able to:

1. Demonstrate a sound knowledge of quantitative and qualitative forecasting processes.
2. Detect trend, seasonal, and cyclical patterns in time series data.
3. Identify moving averages and various smoothing methods.
4. Estimate and interpret causal models including bivariate and multivariate regression models.
5. Decompose underlying components of business and economics time series.
6. Identify and interpret mixed autoregressive and moving average models.
7. Estimate and interpret ARCH and GARCH models to forecast volatility in financial data.
8. Estimate vector autoregressive models, impulse response functions, and forecast error variance decompositions.
9. Improve forecasting accuracy by combining alternative forecasts.
10. Apply appropriate forecasting methods to various fields in business and economics using real-world data.

Prerequisites

ECON 2330 or ECON 3330 or equivalent

Co-requisites

None

Texts/Materials

Wilson, Keating, and John Galt Solutions, Business Forecasting With ForecastX®, Sixth Edition, McGraw-Hill.

Hill, Griffiths, and Lim, Principles of Econometrics, Fourth Edition, Willey & Sons.

Student Evaluation

Participation	0-20%
Assignments/quizzes	0-20%
Project	0-25%
Midterm(s)	30-60%
Final exam	30-50%

Course Topics

1. Qualitative Forecasting Methods

- Quantitative and qualitative forecasting
- New product forecasting - BASS model
- Executive opinions
- Sales forces opinions
- Consumer surveys
- Delphi method

2. Forecast Process, Data Considerations, and Model Selection

- Trend, seasonal, and cyclical patterns
- Statistical review
- Correlograms

3. Moving Average and Exponential Smoothing

- Moving average
- Holt's and winters' exponential smoothing
- New-product forecasting

4. Forecasting with Regression Methods

- Bivariate regression model
- Forecasting with simple linear trend
- Serial correlation and heteroscedasticity
- Applications

5. Forecasting with Multiple Regression

- Multiple regression model
- Selecting independent variables
- Statistical evaluation of multiple regression models
- Serial correlation and omitted-variable problem
- Applications

6. Time-Series Decomposition

- Basic time series decomposition model
- Deseasonalizing and seasonal indices
- Time series decomposition forecast
- Applications

7. Box-Jenkins Methodology- ARIMA

- Philosophy of Box-Jenkins
- Moving average models
- Autoregressive models
- Mixed autoregressive and moving average models
- Box-Jenkins identification process
- Forecasting seasonal time series
- Applications

8. Forecasting of Dynamic Behavior of Economic and Financial Time Series

- Non-stationary time series data and cointegration
- Vector autoregressive (VAR) models
- Impulse response functions
- Forecast error variance decompositions
- ARCH and GARCH models

9. Combining Forecast Results

- What kind of forecasts can be combined?
- Three techniques for selecting weights when combining forecasts
- Applications

10. Implementing Forecasting

- Forecast process
- Choosing the right forecasting techniques
- Special forecasting considerations

Methods for Prior Learning Assessment and Recognition

As per TRU policy

Attendance Requirements – Include if different from TRU Policy

As per TRU policy

Special Course Activities – Optional

Use of Technology – Optional