

Academic Year: ( 2019 / 2020 )

Review date: 06-05-2019

Department assigned to the subject: Economics Department

Coordinating teacher: GONZALO MUÑOZ, JESUS

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester : 1

## OBJECTIVES

The goal of this course is understand the time evolution of the most relevant economic time series (GNP, Unemployment, inflation, interest rates, exchange rates, financial asset prices, etc.) and the analysis of the dynamic causal relationships existing among those variables in order to perform forecasts and economic policy analysis.

To achieve this goal, the student must acquire knowledge, abilities (specific and general) and attitudes.

Knowledge: At the end of the course the student will be able to:

- Construct adequate models to obtain forecasts
- Construct adequate models to analyze causal relationships between economic variables
- To analyze the growth of economic variables and their long-term relationship.

In term of concrete questions, the student will learn to answer in a quantitative and synthetic way, via an empirical project, to questions of this type:

- How interest rates affect economic growth, employment level, prices, etc.?
- How economic growth affects CO2 levels, and those affect temperature?
- Is it possible to forecast the returns of financial assets?

Specific abilities:

- Isolate and analyze the main characteristics of the evolution of economic data.
- Distinguish different types of data and the components of a time series.
- Build appropriate models for testing economic hypotheses and forecasting.
- Evaluate and criticize different approaches for dealing with an applied problem.

General skills

- Solve complex problems.
- Discrimination of relevant information contained in economic data on a problem.
- Relate different description measures of data and diagnostics on the validity of a model.
- Flexibility on the use of a model for different goals.
- Use of computer packages of econometric modeling.
- Analysis and synthesis.
- Group work.
- Oral, written and graphical communication skills.

Attitudes:

- Critic attitude on solutions and models provided by alternative analysts.
- Constructive attitude based on partial information and approaches.

## DESCRIPTION OF CONTENTS: PROGRAMME

The basic contents of the course are:

- Characteristics of time series data.
- Univariate stationary models.
- Forecasting and model selection.
- The linear regression model with autocorrelated error: robust inference.
- Dynamic single-equation econometric models: endogeneity problems. Instrumental variables solutions

- (Two Step Least Squares). Endogeneity tests.
- Dynamic multi-equation models (VAR) and causality analysis.
  - Non stationary processes: trend-cycle decomposition.
  - Regression with nonstationary variables: testing different economic theories.

## LEARNING ACTIVITIES AND METHODOLOGY

The teaching methodology minimizes the formal aspects, focusing on the intuitive discussion of concepts and intensive work with real data sets, aiming that the student reaches a practical mastering of econometrics with time series economic data.

The course comprises lectures, and problem and practical classes:

Lectures and problem classes:

- They will use both blackboard and computer with projector.
- Each section contains a typical empirical application.
- The applied data analysis is performed with the package E-Views (or alternatively with the free software GRETL) and the database HIS Global Insight (reachable online through library).

Computer practical classes:

- Every week there will be a session in the computer room to solve applied empirical problems related with the empirical course project.

## ASSESSMENT SYSTEM

<b>% end-of-term-examination:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40

Final Exam (60%) + Practical classes (20%) + Empirical Project (20%).

Final exam: it assesses the knowledge acquired by the students in the course.

The practical classes include problem sets related with the theoretical concepts developed in the course and student progress will be assessed through three-week quizzes in class.

The empirical project is chosen by the student among the choices offered by the lecturer at the beginning of the course. It contains a maximum of five pages where the student has to show her/his capacity for synthesis and analysis, critic reasoning and a good command of quantitative tools.

80% attendance is required for empirical project and quizzes to be graded.

## BASIC BIBLIOGRAPHY

- Brockwell, P. & R. Davis Introduction to Time Series and Forecasting (segunda edición), Springer-Verlag.
- Enders, W Applied Econometric Times Series (segunda edición), John Wiley.
- Lectures Notes <http://www.eco.uc3m.es/~jgonzalo/teaching/TecnicasEconometricas.html>, -, -
- Notes de Clase <http://www.eco.uc3m.es/~jgonzalo/teaching/TecnicasEconometricas.html>, -, -
- Stock, J. & M. Watson Introduction to Econometrics, Addison-Wesley.
- Thomas Nechyba, Intermediate Microeconomics an intuitive approach with calculus,, CENGAGE,, 2018
- Wooldridge, J. Econometrics: A Modern Approach (segunda edición) [Versión en español: Introducción a la Econometría: un enfoque Moderno], South-Western.

## ADDITIONAL BIBLIOGRAPHY

- Aznar, A. y F.J. Trivez Métodos de Predicción en Economía (vols 1 y 2), Ariel.
- Diebold, F. Elements of Forecasting (segunda edición), South-Western.

- Koop, G. Analysis of Economic Data, John Wiley.
- Mills, T.C. The Econometric Modelling of Financial Time Series, Cambridge UP.
- Otero, J.M. Econometría (Series Temporales y Predicción), AC.
- Perez, C Econometría de las Series Temporales, Pearson Prentice.
- Perez, C Problemas Resueltos de Econometría, Thompson.
- Peña, D Análisis de Series Temporales, Alianza Editorial.

#### BASIC ELECTRONIC RESOURCES

- enlace . web: <http://www.eco.uc3m.es/~jgonzalo/teaching/TecnicasEconometricas.html>