STUDENTS ARE EXPECTED TO HAVE COMPLETED
All the previous courses on Mathematics, Statistics and Econometrics.

COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.
An adequate knowledge on the following topics.
1.- Main stylized facts in economic time series.
2.- Quantitative models to represent these series: a) univariate models: deterministic and Arima; b) dynamic single-equation models with exogenous variables; c) VAR models for stationary time series and d) single-equation and multi-equation models for cointegrated time series.
3.- Methodology for building the models in point 2 with real data of the Spanish and Euro Area economies.

BY-PRODUCTS.
Resolution of problems using data. Knowledge of econometric software for professional work. Analysis of real data through econometric models.

DESCRIPTION OF CONTENTS: PROGRAMME
Chapter 1. TIME SERIES ECONOMETRICS FOR BUSINESS. PROPERTIES OF TIME SERIES AND STATISTICAL FRAMEWORK FOR THEIR ANALYSIS
1.1 Econometrics for economists. Quantitative methods for business
1.2 Random samples and properties of time series
1.3 Components of a time series: trend, seasonality, cycle and disturbances.
1.4 Trend and seasonal. Stationarity transformations
1.7.1 Deterministic trends and seasonality
1.7.2 Segmented trends
1.7.3 Stochastic trend and seasonality

Chapter 2. LINEAR UNIVARIATE ARIMA MODELS
2.1 Stationary stochastic processes
2.2 Autocorrelation function and its estimation
2.3 White noise process
2.4 First order autoregressive model: AR (1)
2.5 Generalization to AR (p) models
2.6 Integrated models: ARI (l, p)
2.7 ARMA and ARIMA models

Chapter 3. SPECIFICATION, ESTIMATION AND DIAGNOSIS OF ARIMA MODELS
3.1 Box-Jenkins methodology
3.2 Initial specification
3.2.1 Unit root tests
3.2.2 Analysis of correlograms and partial correlograms of the original series and its transformations
3.2.3 Information criteria
3.3 Estimation: hypothesis testing
3.4 Diagnosis of ARIMA models:
a) Residual analysis
b) Tests of alternative models

Chapter 4. STATIONARY MULTIVARIATE MODELS
4.1 Stationary VAR(p) model.
4.2 Granger causality.
4.3 Estimation of VAR models
Chapter 5. NON-STATIONARY MULTIVARIATE MODEL
5.1 Models with integrated variables. Spurious regression.
5.2 Cointegration
5.3 Vector equilibrium correction models (VEqCM)

LEARNING ACTIVITIES AND METHODOLOGY
Lectures with slides available in the web page of the course.
Classes for analytical and empirical problems, with additional solved problems in the web page of the course.
Classes in the computer room to work with real data.

ASSESSMENT SYSTEM
60% written final exam.
40% two written partial evaluations.
To pass the course a minimum calibration of 5 out of 10 in the final exam is required.

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

BASIC BIBLIOGRAPHY
- PEÑA, D. Análisis de series temporales, Alianza Editorial, 2005

ADDITIONAL BIBLIOGRAPHY