

# Course Outline: Macroeconometrics

(English Version)

**Degree: Licenciatura en Economía (7 credits)**

**Second Term (2006/07 Academic Year)**

**Professor: Genaro Sucarrat (gsucarra@eco.uc3m.es)**

**Coordinator: Juan J. Dolado (dolado@eco.uc3m.es)**

## A. Objective

The objective of the course is to introduce the student to econometric concepts and methods useful for macroeconomic hypothesis testing, modelling and forecasting, in addition to basic techniques of business-cycle analysis. Pre-requisites for following the course are basic statistics, basic calculus, linear algebra, and the insights acquired in the Macro I and II sequence. Lectures and exercise sessions will be given in Spanish, but some of the course material – including the main-textbook and the software that will be used – is in English.

## B. Outline

### 1. Introduction [1 week]:

- Course overview (content, pre-requisites, evaluation)

### *Part I: Single-equation analysis*

### 2. Time-series econometrics [2 weeks]:

- Spurious regression, stationary and non-stationary variables
- Trends, the difference operator, the lag-operator
- ARMA models, the Beveridge-Nelson and the Hodrick-Prescott decompositions

### 3. Single equation econometric hypothesis testing and modelling [2 weeks]:

- Estimation and inference in the linear model
- Congruency, nested models
- The general unrestricted model (GUM), general-to-specific (GETS) modelling, the specific model
- Simple-to-general (STOG) modelling
- Microfoundations

### 4. Seasonality and non-linearities [1 weeks]

- Seasonal dummies, seasonally adjusted variables
- Parameter vs. regressor non-linearity, threshold variables
- Non-linear least squares (NLS) estimation and inference
- Autoregressive conditional heteroscedasticity (ARCH) models

### 5. Equilibrium correction models (EqCMs) and co-integration [2 weeks]

- The EqCM, short-term vs. long-term dynamics
- Equilibrium correction and Engle-Granger cointegration analysis

## *Part II: Multi-equation analysis*

### 6. Vector auto-regression (VAR) models [2 weeks]

- Structural vs. reduced form, impulse-response analysis
- Formulation, estimation, diagnostics, lag-selection
- The PVAR, weak and strong exogeneity, Granger-causality, the Lucas-critique, super exogeneity

### 7. Vector equilibrium correction models (VEqCM) [2 weeks]

- The VEqCM
- The Johansen approach to multivariate co-integration analysis

### 8. Summary and conclusions [1 week]

## **C. Bibliography**

The main textbook is Kerry Patterson (2000), *An Introduction to Applied Econometrics* (Palgrave), and most of the topics in the course are covered there. Exact referencing and supplementary reading will be provided at the start of the course.

## **D. Exercises**

Exercises associated with each topic will be distributed.

## **E. Evaluation**

The evaluation will consist of two parts: The final exam (70%) and an empirical study in essay-form (30%).

## **F. Software**

Computer sessions will be given using EViews, but the student is in principle free to choose which software to use.