# Statistics and Econometrics for Economy Decisions

## Prof. Riccardo Bramante; Prof. Luca Bagnato

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

This modular course aims at getting students acquainted with problems and methods of quantitative analysis of economic data, bridging the statistical and the econometric standpoints. The course will cover topics such as data sources, index numbers, time series analysis, econometric model building and forecasting.

At the end of the course, students will be able to:

– construct synthetic price indicators and measure inflation;

– compare monetary values over time and space;

– graphically represent time series in an adequate way, and use classical decomposition methods;

– read and interpret the results from a statistical analysis of a time series and a regression output;

– choose between different models and estimation methods and test the hypotheses suggested by the theory;

– perform empirical analyses on real data using the GRETL statistical package.

***COURSE CONTENT***

First module: (*Professor Riccardo Bramante*)

*Basic economic information*

– Statistical methods for estimating GDP.

– Index numbers (price indices – manufacturing output and stock exchange).

– Spatial comparisons of economic aggregates.

*Analysis of economic and financial time series*

– Decomposition methods and parameter estimation using the least squares method.

– Parameter estimation using the weighted least squares method.

*Statistical methods for studying economic trends*

Second module: (*Professor Luca Bagnato*)

*Relationships between economic variables*

– From regression to econometric modelling.

– Best-fit estimation methods.

– Measuring the goodness of fit.

*Economic forecasting*

– Model-based forecasting.

– Analyzing the prediction error.

*Introducing the distribution hypothesis*

– Normality and its consequences.

– Beyond normality in economics and finance.

*Introduction to Gretl.*

***READING LIST***

For the first module

A. Predetti, *I Numeri Indici. Teoria e pratica,* Giuffrè, Milano (latest edition).

L. Santamaria, *Analisi statistica delle serie storiche economiche,* Vita e Pensiero, Milan, 2000.

E. Bee Dagum, *Analisi delle serie storiche: modellistica, previsione e scomposizione*, Springer-Verlag, Milano, 2002

For the second module

M. Faliva-M.G. Zoia, *Introduzione all’econometria,* Giappichelli, Turin, 2003.

***TEACHING METHOD***

Lectures, exercises in the computer laboratory, and workshops on specific subjects.

***ASSESSMENT METHOD AND CRITERIA***

The final assessment is composed of a written test for each module including multiple-choice and open-ended questions and exercises. A mid-term exam on the contents of the first module is contemplated. Further information on the mid-term test will be made available on the Blackboard platform. The overall assessement will be made by the avereage of marks obtained for the two modules.

***NOTES AND PREREQUISITES***

*Prerequisites*

The course requires knowledge of basic statistics (data analysis, probability and inference), on a par with what is taught in the "Statistics I" and "Applied Statistics" courses as part of the three-year Economics Faculty degree courses.

In case the current Covid-19 health emergency does not allow frontal teaching, remote teaching will be carried out following procedures that will be promptly notified to students.

Further information can be found on the lecturer's webpage at http://docenti.unicatt.it/web/searchByName.do?language=ENG or on the Faculty notice board.