# Health econometrics and program evaluation

## Prof. Giuseppe Arbia; Prof. Alain pirotte

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

The course aims at introducing the student to a rigorous study of the basic econometric models by studying the statistical properties of the various parameter estimators. It also aims at introducing the student to use of the R © statistical package in an econometric context and to correctly interpreting the results of the estimates.

At the end of the course the student:

• will know the properties of the various estimators and will therefore be able to choose the best in each specific case

• will know how to estimate various types of regression models with the use of the R © statistical software

• will know how to accurately interpret the meaning of the estimated parameters and the different statistical tests calculated to complement the regressions

***COURSE CONTENT***

Part I (Prof. G. Arbia):

Simple linear regression, ordinary least squares estimate (OLS). Maximum likelihood estimation. Method of moments estimation. Multivariate linear regression. Violation of the hypotheses of validity of OLS: Normality, Heteroskedasticity, Temporal and Spatial Autocorrelation.

Part II (Prof. A. Pirotte):

Discrete choice models and non-linear regression. Spatial panel data econometric.

***READING LIST***

Arbia, G. (2014) A Primer for Spatial Econometrics: With Applications in R (Palgrave Texts in Econometrics), Palgrave MacMillan

Greene W. (2018) Econometric Analysis, 8th Edition, Pearson

***TEACHING METHOD***

Lectures, laboratories with the use of the R © software. On a weekly basis students will be offered laboaratories on the use of R and R Studio ©. The laboratories will be conducted by Dott. Vincenzo Nardelli.

***ASSESSMENT METHOD AND CRITERIA***

Option 1:

Optional intermediate exam on PC after week 6. In the computer lab, students will perform practical exercises using RStudio © software. If successful, the intermediate exam will account for 50% of the final grade. Final examination will be carried out with the same criteria as the intermediate test with a possible additional oral examination. Those who will successfully pass the intermediate exam, at the final exam will be tested only the second part of the course. The intermediate exam can only be used during the winter session at the end of the course, in the January and February appeals.

Option 2:

Full exam in any of the sessions planned during the year. In the computer lab, students will perform practical exercises using R and RStudio © software. Those passing the practical test in the computer lab could be called for an oral examination.

***NOTES AND PREREQUISITES***

Warnings: In the first lesson of the course the professor will indicate to the students how to download the RStudio software and the main R packages used throughout the course.

Prerequisites:

* Prerequisites: a basic three-years degree course in statistics that includes descriptive statistics, probability, inductive statistical inference (point and interval estimators), hypothesis testing and the simple linear regression model.
* Basic notions of the language R. Students who do not possess the necessary prerequisites with the software R will be helped with *ad-hoc* sessions organized outside the official timetable in the first 2 weeks of the course.

Recommended texts for prerequisites:

For the statistical background:

Levine, J-Szabat-K. and Stephan, D. (2018) Business Statistics, Pearson.

For the language R:

Wickham, H., Grolemund G. (2018) R for Data Science, O’Reilly. Freely available on-line at <https://r4ds.had.co.nz/index.html>