UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Generalized Linear Model

2021-1-F8203B010-F8203B010M

Learning objectives

The aim of this course is the analysis of advanced statistical models, from the classical linear model to the multivariate models.

Contents

The aim of the course is the study of more advanced models of the classical linear model. It also presents

• generalized linear models, multivariate linear models

• multilevel models

The training is carried out through lectures and laboratory practical lessons. The course material and additional information will be posted on the web page in the e-learning platform unimib: http://elearning.unimib.it/.

Detailed program

The course aims at introducing at the specification, estimation and verification of the interpretative advanced linear models compared to the classical linear model. It also presents:

· Generalized linear models that do not meet the assumptions of the classical linear model: models with

esteroschedastici and related errors, non-linear models, the treatment of outliers

· Multivariate linear models of classic and not

· Multilevel models

Each area will be the specific object of a course module. The training is carried out through lectures and practical classes in statistical and computer lab in which you will face analysis of empirical cases by the use of SAS software. The material of the course (both the theoretical lessons both practical lessons) and additional information will be posted on the web page in the e-learning platform unimib: http://elearning.unimib.it/.

Prerequisites

It is requested a good knowledge of:

Univariate descriptive statistics: position indeces; variability indices: symmetry an d kurtosis indices.

Bivariate descriptive statistics: connection, average dependence, linear correlation, linear bivariate,
Multiple, multivariate, polynomial, non-linear regressions.

Probability theory: population and sample; probability in the classic version; combin atorial calculation elements; sampling types; distributions of univariate random variables; random variables Normal, t of Student, F d Snedecor; random sampling dist ributions

Inference:estimation theory, property of the punctual estimators; interval estimation ;hypothesis tests: general theory, Neyman Pearson hypothesis tests,

hypothesis tests on mean (Normal t of Student) and variance.

Therefore student that do not have these previous knowledge in statistics are requested to attend biostastistics courses and pass exams of
of: probability calculation, introduction to stastistical inference, introduction to statistical models, statistical models for data categorical . The students also have to know the R or SAS statistical packages.

(in the three-year degree or in the degree course of biostatistics) exams of: univariate and bivariate statististics, probability calculation, introduction to stastistical inference, introduction to statistical models, statistical models for data categorical . The students also have to know the R or SAS statistical packages.

Teaching methods

The course presents both theoretical and applied classes. During the theoretical part, the methodological frameworks related to the course are presented and then applied during the practical lessons in the laboratory. In the lab, you use SAS or R software, and you'll learn how to code and interpretate model outputs. Lessons and exercises will be recorded on the e-learning platform

Assessment methods

The examination is carried out by means of a test at the computer laboratory and consists of two theoretical questions and a practical exercise. The exercise covers one of the topics proposed during the classroom exercises and involves solving a problem using R or SAS software and commenting on the results.

Textbooks and Reading Materials

Johnston, J. (1993), Econometrica, 3a edizione, Franco Angeli, Milano

- Freund, R. J., Wilson, W. J., and Sa, P. (2006), Regression Analysis: Statistical Modeling of a Response Variable, 2nd edition, Academic Press

- Baltagi B. H. (2008), Econometrics, fourth Edition, Springer Berlin

- Littell, R. C., Freund, R. J., and Spector, P. C. (2002), SAS for Linear Models, 4th Edition, Cary, NC: SAS Institute Inc.

- Manual SAS/STAT 9.2

- Manual SAS/STAT 9.3

- Manual SAS/ETS 9.3

Semester

3 cycle which corresponds to the 2nd semester in the period between March and April.

Teaching language

Italian