Generalized Linear Models (62105)

Instructors: V.VASDEKIS

Core Course, 2nd semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

Course Description

Introduction to statistical modeling, exponential family of distributions, parts of a GLM, analysis of binomial data, logit models, Poisson models, log-linear models for analysis of categorical data, analysis of overdispersion, normal data, multinomial and ordinal data. All applications include the use of the R language.

Prerequisites

Students should have basic knowledge of mathematical calculus and probability theory.

Target Learning Outcomes

Upon successful completion of the course, students are expected to understand if the nature of their data allows application of a generalized linear model (knowledge and understanding). They should also be able to define the appropriate generalized linear model to the data at hand (application). They should be able to fit this model and interpret the results of analysis (skill). Finally, they should be able to explain to scientists of other disciplines the results of their analysis (synthesis).

Recommended Bibliography

- Agresti (2013). Categorical data analysis, Wiley Atkinson (1985). Plots, transformations and regression, Oxford university Press

- Carroll and Ruppert (1988). Transformation and weighting in regression, Chapman and Hall

- Chatterjee and Price (1977). Regression analysis by example, Wiley.

- Christensen R. (1998). Analysis of variance, design and regression. Chapman and Hall.

- Collett, D. (1991) Modelling Binary data, Chapman and Hall

- Cook and Weisberg, S. (1982). Residuals and Influence in regression, Chapman and Hall

- Dobson, A., Barnett, A.G (2008). An introduction to generalized linear models, Chapman and Hall.

- Draper and Smith (1981). Applied regression analysis, Wiley.

- McCullagh, P and Nelder, J.A. (1989) Generalized Linear Models, Chapman and Hall.

- Montgomery, D.C. (1989) Design and Analysis of Experiments, Wiley

- Montgomery, D.C., Peck, E.A. and Vining, G.G. (2001). Introduction to linear regression analysis. Wiley.

- Ryan (1997). Modern regression methods, Wiley.

- Weisberg, S. (1985) Applied Linear Regression, Wiley

- Venables W.N. and Ripley B.D (1999) Modern Applied Statistics with S-Plus, Springer

Teaching and Learning Activities

One three-hour lecture per week, study exercises as homework (some to be submitted).

Assessment and Grading Methods

The final grade is the weighted average of the final examination grade (70%) and the grade of the study exercises to be submitted (30%).