Regression Models

Academic Year: (2019 / 2020) **Review date: 30-04-2019**

Department assigned to the subject: Statistics Department

Coordinating teacher: DURBAN REGUERA, MARIA LUZ

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Probability
Statistical Inference
Programming in R

OBJECTIVES

SKIILS ACQUIRED:

CG1 Ability to apply analysis techniques with the aim to adapt the information to real problems.

CG2 Ability to identify the best stochastic model for each real problem, and to apply it for its analysis, design and solution.

CE5 Apply advanced statistical foundation for the development and analysis of real problems that include the prediction of a response variable.

KNOWLEDGE ACQUISITION

1) linear models
2) generalized linear models
3) generalized additive models

DESCRIPTION OF CONTENTS: PROGRAMME

Regression Models

1) Linear regression: Estimation. Inference. Diagnostics.
2) Introduction to Generalized Linear Models: Exponetial family. Estimation. Inference. Diagnostics.
4) Logistic Regression, Multinomial, Ordinal, Poisson.
3) Generalized Additive Models: Smoothing Methods. Penalized Splines. Estimation. Smoothing parameter selection

LEARNING ACTIVITIES AND METHODOLOGY

Learning activities:
Master classes
Exercises
Computer labs
Projects

Teaching methodologies:
Presentations of the professor in class with computing and visual media, where the professor develops the mail concepts of the subject and provides bibliography supplementing the knowledge of students.
Critical reading of texts recommended by the professor: manuals and/or academic papers, either for their posterior discussion in class, or for widening and consolidating the subject matter.

ASSESSMENT SYSTEM

SE1 Participation in class 10%
SE2 Assignments done during the course 90%

% end-of-term-examination:	0
% of continuous assessment (assigments, laboratory, practicals…):	100

BASIC BIBLIOGRAPHY

- Annette J. Dobson, Adrian G. Barnett An Introduction to Generalized Linear Models, CRC Press, 2018
- Julian J. Faraway Extending the Linear Model with R: Generalized Linear, Mixed Effects and Nonparametric Regression Models, CRC Press, 2016
- Michael H. Kutner, Chris J. Nachtsheim, John Neter Applied Linear Regression Models, McGraw-Hill Higher Education, 2003
- P. McCullagh, John A. Nelder Generalized Linear Models, CRC Press, 1989
- Simon Wood Generalized Additive Models: An Introduction with R, Chapman & Hall/CRC Texts in Statistical Science, 2017