Universidad Zaragoza

Academic Year/course: 2021/22

27033 - Regression Methods

Syllabus Information

Academic Year: 2021/22
Subject: 27033 - Técnicas de regresión
Faculty / School: 100 - Facultad de Ciencias
Degree: 453 - Degree in Mathematics
ECTS: 6.0
Year: 4
Semester: First semester
Subject Type: Optional
Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, problem-solving sessions, computer laboratory sessions, seminars, tutorials and autonomous work and study.

4.2. Learning tasks

This course is organized as follows:

- **Lectures and problems-solving sessions.** Active participation will be encouraged by raising open questions to foster discussion and by proposing short application exercises to be solved in class.
- **Computer laboratory sessions.** Students will apply the concepts and techniques covered in the lectures to real cases. The main software is the R-package.
- **Seminars** to show, by groups, a full analyzed data project.
- **Tutorials.** Individual or small groups tutorials upon request.
- **Autonomous work and study.**. Autonomous work supported by the e-learning platform Moodle. Personal study and small-group work for case analysis preparation.

The teaching activities and assessment tasks will take place in a face-to-face mode, except in the case that, due to the health situation, the dispositions emitted by the competent authorities and by the University of Zaragoza compel to take them to a greater or lesser extent in a telematic form.

4.3. Syllabus

This course will address the following topics:

- **Topic 1.** Simple linear regression model. Assumptions, estimation of parameters, inference and validation of regression models.

- **Topic 2.** Multiple linear regression model: Estimation, validation and inference. Analysis of variance and covariance. Strategies for solving assumption departures. Introduction to model selection.
- **Topic 3.** Extending the linear model: an introduction to generalized linear models.

4.4. Course planning and calendar

Final and global exam dates are fixed by the Faculty exams schedule. Other midterm exams or data project presentations will be fixed according the ongoing of the course. In this case, we will publish the exact dates by the e-learning platform and in the lecture class.

Computer laboratory sessions are taught weekly in the place and time assigned, published by the Faculty of Sciences.

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Faculty of Sciences website and Moodle.

4.5. Bibliography and recommended resources

- Sheather, Simon. A Modern Approach to Regression with R / Simon Sheather . - 1st ed. New York : Springer, cop. 2006.
- Chatterjee, Samprit. Regression analysis by example / Samprit Chatterjee, Ali S. Hadi . - 4th ed. Hoboken (New Jersey) : John Wiley & Sons, cop. 2006.
- Dobson, Annette J.. An introduction to generalized linear models / Annette J. Dobson . - 1st ed. London ; New York : Chapman and Hall, 1990.
- Draper, Norman R.. Applied Regression Analysis / N. R. Draper, H. Smith . - 2nd. ed. New York : John Wiley and Sons, cop. 1981.
- Jobson, J. D.. Applied multivariate data analysis. vol. I, Regression and experimental design / J. D. Jobson New York [etc.] : Springer, cop. 1991.
- Montgomery, Douglas C.. Introduction to linear regression analysis / Douglas C. Montgomery, Elizabeth A. Peck, G. Geoffrey Vining . - 4th ed. Hoboken (New Jersey) : John Wiley & Sons, cop. 2006.
- Peña Sánchez de Rivera, Daniel. Regresión y diseño de experimentos / Daniel Peña Madrid : Alianza Editorial, 2002.
- R Development Core Team (2010). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL http://www.R-project.org.
- Vilar Fernández, Juan Manuel. Modelos estadísticos aplicados / Juan M. Vilar Fernández . 2ª ed. A Coruña : Universidade da Coruña, Servizo de Publicacións, 2006.

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=27033