Biostatistics

Academic Year: (2023 / 2024) **Review date: 22-07-2023**

Department assigned to the subject: Statistics Department

Coordinating teacher: DURBAN REGUERA, MARIA LUZ

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Probability
Statistical Inference
Programming in R
Regression Models

OBJECTIVES

The student will acquire the following knowledge:
1) Proficiency of Clinical Trials techniques.
2) Proficiency of Survival analysis techniques.
3) Proficiency of longitudinal data and repeated measurements models.

DESCRIPTION OF CONTENTS: PROGRAMME

1 Clinical Trials Data Analysis
1.1 Basic concepts
1.2 Treatment comparisons
1.3 Meta-analysis

2 Survival analysis
2.1 Basic concepts
2.2 Descriptive methods for survival data
2.3 Regression models for survival data

3 Models for longitudinal data and repeated mesurements
3.1 Hierarchical data
3.2 Models with random intercept and slope
3.3 Generalized Estimating equations

LEARNING ACTIVITIES AND METHODOLOGY

The classes consist of a mixture of presentations on the fundamental concepts of the subject and the presentation of practical cases through the use of software. The statistical language R is preferably used. Students are expected to bring their own laptops to experiment with the code during the lectures.

* Training activities

- AF1: Theoretical lesson.
- AF2: Practical lesson.
- AF5: Tutorials.
- AF6: Group work.
- AF7: Individual work.
- AF8: On-site evaluation tests.

* Teaching methodologies

- MD1: Class lectures by the professor with the support of computer and audiovisual media, in which the main concepts of the subject are developed and the bibliography is provided to complement the students' learning.
- MD2: Critical reading of texts recommended by the professor of the subject: press articles, reports, manuals and/or academic articles, either for later discussion in class, or to expand and consolidate the

knowledge of the subject.
- MD3: Resolution of practical cases, problems, etc. posed by the teacher individually or in groups.
- MD4: Presentation and discussion in class, under the moderation of the professor of topics related to the content of the subject, as well as case studies.
- MD5: Preparation of papers and reports individually or in groups.

ASSESSMENT SYSTEM

Group work carried out during the course (100%) consisting of three parts:
- Exercises and practices on models of test designs on clinical analysis.
- Exercises and practices on survival analysis models.
- Exercises and practices on mixed and longitudinal models.

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

BASIC BIBLIOGRAPHY

- Balakrishnan, N. Methods and Applications of Statistics in Clinical Trials, John Wiley & Sons, 2014
- Gibbons, J.D. and Chakraborti, S. Nonparametric statistical inference, CRC press, 2020
- Hosmer, David W; Lemeshow, Stanley; May, Susanne Applied Survival Analysis: Regression Modeling of Time to Event Data, Wiley-Interscience, 2008
- Moore, D.F. Applied Survival Analysis Using R, Springer, 2016
- Singer, Judith D; Willet, John B Applied longitudinal data analysis : modeling change and event occurrence, Oxford University Press, 2003