Universidad Zaragoza

Academic Year/course: 2022/23

29306 - Biostatistics

Syllabus Information

Academic Year: 2022/23
Subject: 29306 - Biostatistics
Faculty / School: 229 - Facultad de Ciencias de la Salud y del Deporte
Degree: 442 - Degree in Odontology
ECTS: 6.0
Year: 1
Semester: Second semester
Subject Type: Basic Education
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, lab sessions, and autonomous work and study.

4.2. Learning tasks

The learning process designed for this subject is based on the following:

LECTURES, as a basic instrument of introduction of the contents and logical foundations of the subject. In these lectures, examples of application of the theory are also solved by requesting the intervention of the students, who contribute with their previous knowledge.

PROBLEM-SOLVING, where theoretical knowledge is applied to the resolution of specific problems and individual controls are carried out. Problem solving is done individually or in groups. One person in the group can be nominated for the presentation in front of the other students, who intervene in the correction of the problem. These classes allow the active participation of the student, help him/her to fix theoretical knowledge, and bring him/her closer to solving real problems. The teacher acts by clarifying concepts and, if required, providing additional clues. Therefore, they serve both the teacher and the student to control the level of learning.

LAB SESSIONS with free software, focusing on its correct use for the management and basic statistical analysis of the data, as well as the correct interpretation of the outputs of the programme for the different bivariate statistical techniques.

GROUP AND INDIVIDUAL TUTORIALS, which allow the progress of the group and the individual to be assessed, enabling corrective measures to be prescribed.

TUTORIALS BY EMAIL OR VIDEOCONFERENCE for students with problems to maintain face-to-face tutorials.

4.3. Syllabus

This course will address the following topics:

LECTURES

Contents:

Introduction to Biostatistics. Scientific method.

1. Univariate descriptive statistics. Frequency distribution: Tables and Graphs. Measures of central tendency, dispersion, position and shape.

2. Bivariate descriptive statistics. Double entry tables.

3. Probability theory. Random variable and probability distribution models. Analysis of simple diagnostic tests.

4. Introduction to inferential statistics. Sampling. Interval estimation. Sample size.

5. Inferential statistics: Hypothesis testing: fundamentals, types of error, level of significance, power of a test and degree of significance (p-value).

6. Hypothesis testing based on means, variances and proportions. Student's t-test. z-test. Snedecor's F-test.

7. Non-parametric inferential statistics. Mann-Whitney U-test for ranges and Wilcoxon T-test.

8. Correlation and linear regression.

9. Contingency table analysis.

PROBLEM-SOLVING SESSIONS

Contents:

1. Univariate descriptive statistics.

2. Probability theory. Evaluation of simple diagnostic tests.

3. Probability distributions.

4. Parametric and non-parametric statistical inference.

5. Inferential analysis of correlation and linear regression.

6. Contingency table analysis.

LAB SESSIONS

In the classroom with the support of the free statistical programme R and the free spreadsheet Calc.

Contents:

1. Introduction to R. Descriptive statistics.

2. Probability. Evaluation of simple diagnostic tests.

3. Parametric and non-parametric statistical inference.

4. Inferential analysis of correlation and linear regression. Contingency table analysis.

5. Evaluation test.

4.4. Course planning and calendar

The course consists of 6 ECTS credits corresponding to 150 hours of dedication by the student. In this course, the contact hours account for 40%, ie, 60 hours, distributed in the activities as follows:

- 36 hours of lectures
- 14 hours of problem-solving
- 10 hour of computer sessions

Further information concerning the timetable (https://fccsyd.unizar.es/academico/horarios-y-calendarios), 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 Health and Sports Sciences website and Moodle.

4.5. Bibliography and recommended resources

To check the recommended bibliography of this course, please visit the link following:

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=29306&;Identificador=12386