



Universitat de Lleida

DEGREE CURRICULUM **DATA ANALYSIS AND INTERPRETATION I**

Coordination: GOMEZ ARBONES, XAVIER

Academic year 2023-24

Subject's general information

Subject name	DATA ANALYSIS AND INTERPRETATION I			
Code	14091			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Master's Degree in Research, Innovation and Health Transfer	1	COMPULSORY	Blended learning
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRAULA	TEORIA	
	Number of credits	3	3	
	Number of groups	1	1	
Coordination	GOMEZ ARBONES, XAVIER			
Department	MEDICINE AND SURGERY			
Important information on data processing	Consult this link for more information.			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
GOMEZ ARBONES, XAVIER	xavier.gomez@udl.cat	6	

Subject's extra information

Description of the subject / Complementary information of the subject

This subject is part of the compulsory subject of Methodological bases for research, innovation and transfer. It is scheduled for the second semester and is a 6 ECTS subject. The instruction's language is mostly Spanish, Catalan, and some English material. The subject is based in an eminently practical and applied way.

This subject is a basically non-contact subject, structured so that each person can progress according to their availability and dedication, with the help of the CV and the teaching staff. The CV provides students with the material and resources needed to monitor the subject, as well as the activities and tests to be taken and passed. Tutorials are done through videoconferencing, as well as sessions for the follow-up of the subject and resolution of doubts.

There are scheduled face-to-face sessions of the subject within the face-to-face days of the master's degree. If finally the face-to-face sessions could not be carried out, the sessions are expected to be done by synchronous videoconference through the CV, or will be made available to students in video format / presentation recorded on the CV.

In this subject, as a complement and continuation of the subject of Planning and design of translational studies, not only the subject of the analysis and interpretation of the data obtained during the realization of the research project, but also the aspects related to the definition of variables, calculation of the sample size, obtaining and recording the data and the descriptive and contrasting statistical procedures of bivariate hypotheses that must appear in the project.

The course begins with an introduction to the fundamentals of probability and statistics, which support the descriptive and analytical statistical procedures of inferential statistics applied in health sciences. We also address the issues of sampling and sample size calculation.

Next, the most important statistical procedures related to descriptive statistics and the fundamentals of bivariate statistics are presented and worked on. Initially, it begins with the concepts of descriptive statistics, which although they are simple concepts, most of which are probably known, are no less important, as they are the first step in any statistical analysis. The following topics already address aspects related to analytical or hypothesis contrast statistics, and deal in detail with the concepts of null hypothesis, alternative, p value, power, as well as the selection, application, and interpretation of bivariate statistical tests commonly used in health science studies based on the type and characteristics of the variables and study design.

Finally, we will reflect on interpretation of results and on the statistically significant and clinically significant concepts; as well as the procedures and tools that can help us draw relevant conclusions.

It is intended that by passing it the student will be able to write the statistical procedures of a project, perform a basic statistical analysis of data and interpret the results from a statistical and clinical point of view. If you want to learn more about advanced statistical procedures (evaluation of diagnostic tests, survival analysis or multivariate procedures), it is recommended to enroll in the optional subject of 6 ECTS credits of Advanced and Multivariate Analysis.

Specific software is released for statistical procedures. On the one hand, software for calculating the sample size is expected to use free programs such as EPIDAT, etc., or others online (GRANMO). For descriptive and analytical statistical procedures, the Jamovi program is expected to be used. Jamovi is a free software application for data

analysis.. If anyone is interested in using SPSS, training can be provided in this regard and can be used as an alternative (The UdL has a campus license for SPSS and is available in the university's computer rooms). On the other hand, R is also could be used; the R language is a programming language and software development environment for obtaining free statistical calculations and graphs (<https://www.r-project.org/>) that provides a wide variety of statistical and numerical techniques. , and is highly extensible through the use of libraries. Other statistical programs may be submitted or released.

Learning objectives

Academical objectives (Learning objectives)

- To have acquired knowledge in a context of scientific research of the theoretical-practical and methodological aspects.
- To know how to evaluate and select the appropriate scientific theory and precise methodology.
- Demonstrate mastery in the use and management of software for the design of studies and data analysis of a study of its scientific field.
- To know how to clearly convey the results from scientific and technological research or the field of innovation, as well as the most relevant foundations on which they are based.

Specific objectives:

- To know the basic concepts necessary for the design, execution, analysis and interpretation of research studies.
- To reflect on the concept of probability and biological variability. Recognize in biostatistics and epidemiology a tool for working with samples.
- To know and apply the procedures for calculating the size of a sample in a health science research project
- To know and differentiate the most used bivariate statistical methods in health sciences, both descriptive and analytical. Reflect on the p and the concept of power.
- To be able to interpret and assess the suitability of statistical methods. Know how to apply and interpret the results of statistical tests. Reflect on the most appropriate statistics, methods of information synthesis and diagrams based on the data and project.
- Learn the basics of handling statistical software. Know how to create a computerized database and be able to analyze data to draw conclusions. Know how to transform and operate with variables. Apply statistical procedures to describe and compare.
- To be able to interpret the results and draw conclusions from a statistical point of view from a scientific and clinical point of view in health sciences.

Competences

Specific Competences

CE2 Carry out a critical analysis of literature, methodological approach and the context, taking into account the professional, ethical and legal principles in health sciences

CE3 Demonstrate knowledge and skills for the development of qualitative methodological designs in health sciences

CE4 Use the appropriate techniques to analyze the data and the relationships between variables or categories in qualitative research in health sciences

Subject contents

Contents

- Introduction to statistics
- Probability
- Inferential statistics
- Sampling and sample size
- Descriptive statistics
- Analytical statistics: hypothesis testing
- Bivariate statistical methods
- Group analysis
- Interpretation of results

Methodology

Methodology

The teaching methodology is aimed at the development of student learning through theoretical classes-seminars, cases and activities aimed at student participation, in addition to the work that the student must develop following problems and assumptions. raised. Enrolled people work autonomously under the direction of teachers. There are face-to-face sessions to summarize, clarify concept and present doubts.

Non-face-to-face dynamics are managed through the CV with the tools of announcements, messaging, video conferencing and others. Work sessions and follow-up by videoconference are proposed, as well as tutorials on demand.

The form of development of the subject is explained, already in part, in the section of Description of the subject / Complementary information of the subject. The subject is structured in lessons, so that each topic is a lesson, in which the resources (videos, texts and others), activities and related tests are presented. Students must work on the resources and answer and pass the proposed activities and tests, so that in order to progress in some lessons it is necessary to have passed some previous ones. Each person can progress according to their availability, although continuous work is recommended and not leave too much material for the end. Tutorials are on demand, although there will be a forum for questions and, where appropriate, thematic forums, and online sessions will be scheduled to be agreed with students.

If finally the face-to-face sessions could not be carried out due to COVID-19 or other circumstances, the sessions will be done via synchronous videoconference through the CV, or will be made available to students in video format presentation recorded on the CV.

Development plan

Information in Methodology section.

Evaluation

Evaluation

For the subject's evaluation regulations of the UdL are followed.

The tests that make up the evaluation system are: attendance and participation in online video conferencing; assistance and participation in face-to-face activities; individual activity and written test.

The statement of the evaluation activities are in Catalan, Spanish and English. The student can write the answer, if applicable, in any of the official languages of the University. The assessment is continuous and takes place within the teaching period delimited for the subject or subject, in accordance with the academic calendar of the course approved by the Governing Council. No alternative evaluation is foreseen.

The activities and tests will be carried out through the tools of the UdL CV, therefore it is essential to have a computer and access to the CV during the academic year. In order to carry out the activities, statistical software

must be run either with the computer itself or by running the computers available at the UdL.

The written exams are scheduled online and the conditions and format of the test are published a few days before the test (number of questions, penalty for incorrect answers, ...).

Students who require or plan to require adaptations in the assessment tests must contact the teacher responsible for the subject during the first 15 days from the beginning of the course to assess their situation.

The final weight of the mark of the evaluation activities are:

- Attendance and participation in online activities: 15%. Exceptional situations of non-attendance must be discussed with the teacher at the beginning of the course.
- Attendance and participation in face-to-face activities: 15%. Exceptional situations of non-attendance must be discussed with the teacher at the beginning of the course.
- Individual activity: 40%: tests, activities, forum, individual or group work on the content of the sessions, etc .
- Written test: 30%. To pass the subject you must get a grade higher than 50% of the possible grade. This activity is entitled to recovery

Assessment activities or assessment results may be taken into account, which may serve to modulate grade in specific situations.

The subject is passed if the final grade taking into account all the evaluative evidence passed is higher than 5/10.

Rating scale: 0.00-4.99: suspended; 5.00-6.99: approved; 7.00-8.99: notable; 9.00-10.00: excellent.

Bibliography

Bibliography

Professors will indicate the most appropriate bibliography and resources during the course. These resources will be available in the UdL library or will be provided by the teaching staff.