



DEGREE CURRICULUM

BIostatISTICS

Coordination: VILAPRIÑO TERRE, ESTER

Academic year 2020-21

Subject's general information

Subject name	BIOSTATISTICS			
Code	101605			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Biotechnology	1	COMMON	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRAULA		TEORIA
	Number of credits	3		3
	Number of groups	2		1
Coordination	VILAPRIÑO TERRE, ESTER			
Department	BASIC MEDICAL SCIENCES			
Teaching load distribution between lectures and independent student work	At Class 60 hours. At Home 90 hours			
Important information on data processing	Consult this link for more information.			
Language	English, Catalan, Spanish			
Distribution of credits	Theoretical classes 50% Seminars 50%			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
COMAS PEREYRA, JORGE SEBASTIAN	jorgecomas@diei.udl.cat	3	
SORRIBAS TELLO, ALBERT	albert.sorribas@udl.cat	3	
VILAPRIÑO TERRE, ESTER	ester.vilapriño@udl.cat	3	

Learning objectives

Statistical techniques are essential to verify whether the available data allow to verify the working hypotheses in any observational or experimental study. In this course, understanding that it is an introductory raw, we set ourselves the main objectives:

- To understand the concept of variability and its influence on the evaluation of results.
- To understand the concept of statistical significance of a result.
- To learn to propose a statistical analysis using the R program
- To understand and know how to use basic statistical models.
- To be able to perform a basic statistical analysis based on the work objectives in each case.

Significant competences

- To be able to understand and critically evaluate biomedical literature in relation to design, statistical analysis and interpretation of results, as well as knowing how to interpret confidence intervals and statistical significance.
- To be able to design simple studies and analyze and interpret the results according to the objectives set.
- To be able to use the R program to perform statistical analyzes.
- To understand the importance of statistics within the scientific method.
- To understand the importance of statistical evidence in the generalization of results of experiments and observational studies.
- To understand the importance of design in planning a study.

Subject contents

1. **From research goals to data: Study Designs**
2. **Clues from Looking at Data: Descriptive statistics**
3. **Statistical thinking: confidence intervals. Interpretation and limitations.**
4. **Statistical modelling: Probability Distributions.**
5. **Statistical modelling: linear regresion.**
6. **Statistical modelling: experimental design.**
7. **Statistical thinking: hands-on projects**

Methodology

In the theory classes the basic concepts will be raised and the technical aspects necessary to make a good analysis of the data will be worked on. The analysis procedures with the R program will be introduced and application examples will be discussed.

In the seminars, concrete examples will be analyzed, emphasizing the use of R as an analysis tool. The practical sessions, with the exception of the first three, are organized around specific projects that will address the issues to be resolved by the student regarding the methods and procedures of the subject. Students must develop the analysis of several projects and submit reports that will be

evaluated. R is a statistical analysis program of great power and free distribution that runs on any platform.

Development plan

		Total	Teoria	Pràctica
1	From research goals to data: Study Designs	3	3	
2	Clues from Looking at Data: Descriptive statistics	8	4	4
3	Statistical thinking: confidence intervals. Interpretation and limitations.	6	3	3
4	Statistical modelling: Probability Distributions.	8	8	
5	Statistical modelling: linear regresion.	10	6	4
6	Statistical modelling: experimental design.	18	10	8
7	Statistical thinking: hands-on projects	7		7

Evaluation

- 1st Exam 20% NO Recovery exam
- 2nd Exam 45% Recovery exam – EVERYTHING!! At least a 5 is required.
- Final work 25%
- Seminars 10%

Changes in the development and evaluation of the course will be indicated in the resources section of the virtual campus depending on the conditions imposed by the SARS-COV-2 pandemic.

Bibliography

Basic:

- Sorribas A, Abella F, Gómez X, March J. (1997) Metodologia estadística en ciències de la salut: Del disseny de l'estudi a l'anàlisi de resultats. Lleida: Edicions de la Universitat de Lleida.
- Daniel WW. (1995) Bioestadística: base para el análisis de las ciencias de la salud. México: UTEMA.
- An Introduction to R. W. N. Venables, D. M. Smith and the R Core Team. <https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf>

Complementary:

- Bland M (2000). An introduction to medical statistics, 3rd ed. Oxford: Oxford University Press.
- Altman DG. (1990) Practical statistics for medical research. Chapman & Hall/CRC; 1st ed.
- Gonick L, Smith W. The cartoon guide to statistics. HarperCollins Publishers, Inc. New York, 1993.

Additional:

- The notes and materials that must be worked during the course will be deposited in the Resources folder of the Virtual Campus.