VNIVERSITAT Ð VALÈNCIA

COURSE DATA

Data Subject	
Code	34067
Name	Statistics
Cycle	Grade
ECTS Credits	6.0
Academic year	2021 - 2022

Study (s)			
Degree	**Center**	**Acad. year**	**Period**
1201 - Degree in Pharmacy	Faculty of Pharmacy and Food Sciences	1	First term
1211 - D.D. in Pharmacy-Human Nutrition and Dietetics	Faculty of Pharmacy and Food Sciences	1	First term

Subject-matter		
Degree	**Subject-matter**	**Character**
1201 - Degree in Pharmacy	7 - Statistics	Basic Training
1211 - D.D. in Pharmacy-Human Nutrition and Dietetics	1 - Asignaturas obligatorias del PDG Farmacia-Nutrición Humana y Dietética	Obligatory

Coordination	
Name	**Department**
CORBERAN VALLET, ANA	130 - Statistics and Operational Research

SUMMARY

This course aims to provide students with the tools and basic concepts of Statistics which are necessary to state statistical hypotheses, recognize simple probabilistic models, analyze data obtained by either direct observation of the environment or as a result of controlled experiments in laboratories and make decisions based on the conclusions drawn from this analysis. An additional purpose of this course is to motivate students in the study and application of Statistics, using the proper tools to solve real problems.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

There are no recommendations as it is an introductory course.

OUTCOMES

1201 - Degree in Pharmacy

- Calculate integrals with different methods for calculating primitives.

- Solve simple ordinary differential equations.

- Design simple experiments that may be useful to achieve the objectives of the study.

- Describe and synthesise the dataset observed in the experiment.

- Analyse the data observed using a statistical package.

- Interpret the results provided by statistical packages.

- Prepare and submit a report of the experimental study conducted.

LEARNING OUTCOMES

The students will know the basics of statistical inference and they will be able to both calculate probabilities associated with random events using a probabilistic model and to resolve the most commonly used tests for comparison of means, proportions and categorical data, including some non-parametric methods.

This course also aims to encourage the students to:

• work together.

• plan and organize the work.

• express suitably their thoughts and decisions.

DESCRIPTION OF CONTENTS

1. Exploratory data analysis

Samples and populations. Types of variables. Graphical and numerical description of samples and variables

2. Introduction to probability

Events and probability. Random variables. The binomial distribution. The Normal curves. Areas under a Normal curve.

3. Statistical analysis of a sample

Population parameters. Estimation of a population mean. Hypothesis testing for a population mean. Normality test. Non-parametric alternatives.

4. Statistical analysis of two samples

Comparison of two paired samples. Confidence interval and the paired-sample t test. Nonparametric alternatives.
Comparison of two independent samples. Confidence interval for the difference of two population means. Hypothesis testing: the test t. Nonparametric alternatives.

5. Statistical analysis of k independent samples

Statistical design of k independent samples. Analysis of Variance and post-hoc tests. Nonparametric alternatives

6. Analysis of categorical data

Analysis of a population proportion. The Chi-Square Goodness-of-fit test. Contingency tables. The Chi-Square test.

7. Linear regression models

Descriptive statistics of two numerical variables. Regression line. Statistical inference of the linear model. Confidence interval for the prediction. Other regression models

8. Elementary notions of Differential and Integral Calculus

Derivatives and integrals. Ordinary Differential Equations.

9. LABORATORY SESSIONS

Exploratory data analysis.
Statistical analysis of a sample.
Statistical analysis of independent samples.
Categorical data.
Linear regression models.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	45,00	100
Computer classroom practice	10,00	100
Tutorials	2,00	100
Study and independent work	45,00	0
Preparation of evaluation activities	30,00	0
Preparation of practical classes and problem	15,00	0
TOTAL	147,00	

TEACHING METHODOLOGY

Theory classes will be devoted to develop the agenda and raise problems whose solution requires the methodology corresponding to each subject. WE will introduce the appropriate statistical technique and apply it to solve proposed problems using statistical software. For the preparation of the course the student will have a collection of proposed problems, separated by subjects, which they will have to resolve on their own.

The practical sessions will take place in a computer room and will be synchronized with the theory; they will allow the student to solve problems by applying several statistical procedures.

All materials will be available in the Virtual Classroom.

EVALUATION

The final grade for the course is calculated from the following three blocks:

- B1. Theoretical-practical exam, the resolution of which requires the interpretation of different outputs of the statistical software R used during the course: 60% of the final grade. The minimum grade required in this block to compensate with the other blocks is 5 out of 10.

- B2. Resolution of theoretical and practical questions and problems raised throughout the course related with the theory sessions: 20% of the final grade.

- B3: Resolution of the case studies raised in the sessions in the computer room and whose resolution requires the use of the statistical software R and the interpretation of the results obtained: 20% of the final grade.

The continuous evaluation, corresponding to blocks B2 and B3, is not recoverable. In the second call of the subject, only the theoretical-practical exam (block B1) will be repeated and the grades obtained in blocks B2 and B3 will be kept.

REFERENCES

Basic

- Samuels, M.L., Witmer, J.A. y Schaffner, A. Fundamentos de Estadística para las Ciencias de la Vida (4a ed.) Pearson Educación S.A. (2012)

- - Cobo, E. Bioestadística para no estadísticos. Elsevier-Masson. (2007)
  - Milton, J.S. Estadística para Biología y Ciencias de la Salud. (3ª ed.) Madrid: McGraw-Hill Interamericana. (2001)

Additional

- Chase, W. & Brown, F. General Statistics. (2nd ed.) Wiley. (1992)
   - Norman, G.R. y Steiner, D.L. Bioestadística. Madrid: Mosby/Doyma Libros. (1996)

- Rueda, P. Curso básico de matemáticas para universitarios. Laboratori de Materials. Publicacions de la Universitat de València (2009).

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

Teaching methodogy

All teaching material will be available in the Virtual Classroom (AV). For the development of non-face-to-face theory sessions, synchronous BBC videoconferences will be held, alternating with problem-based learning. In this way, the teachers responsible for the subject are allowed to clarify the different concepts / tools presented in the material provided, while autonomous learning by the students is facilitated. The solution of some of the most important problems of each topic will be uploaded to the AV so that the students can check if they have adequately understood the concepts / tools introduced. In addition, the subject forum will be used so that the students can ask doubts and their discussion is visible to the rest of the class.

Regarding the non-face-to-face computing sessions, an explanatory document will be uploaded with the main tools that will be worked on in each session together with the corresponding commands for their implementation in the statistical software R. Synchronous BBC videoconferences will also be held, which will allow explaining the main objectives of each session and clarify doubts before the autonomous work by the students. At the end of each session, the working groups must upload the reasoned solutions of the case studies proposed by the professor to the AV. These tasks will be part of the final grade of the subject (as explained in the following session).

Face-to-face office hours will be replaced by BBC videoconferences, respecting the schedule set for them. The virtual tutoring program is also kept.

Assessment

In case the exam (B1) cannot be done in person at the faculty, different exam models will be prepared (equal in difficulty and duration) that will be distributed to the student through the AV. Likewise, the solution of the exam will be uploaded to the AV by the students once the time established by the professors responsible for the subject has ended.

Is a student does not have the means to establish this connection and access the AV, they should contact the professors by email at the time of publication of this annex to the teaching guide.