COURSE DATA

DATA SUBJECT

Code: 43024
Name: Applied biostatistics and computational methods for analysing and presenting data
Cycle: Master's Degree
ECTS Credits: 5
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
2138 - Master's Degree in Research in and Rational Use of Medicines	Facultat de Farmácia i Ciències de L'alimentació	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2138 - Master's Degree in Research in and Rational Use of Medicines	Applied biostatistics and computational methods for analysing and presenting data	COMPULSORY

COORDINATION

PERIS RIBERA JOSE ESTEBAN

SUMMARY

The course consists of two parts: 1-Applied Biostatistics, 2-computing methods for data analysis and presentation.
In the first part, theoretical and practical nature, the student must acquire the necessary theoretical basis to select and perform appropriate statistical treatments to different situations that you may encounter, both from a research aspect and from a professional perspective. In the research, prior knowledge of the characteristics of the various statistical tests entitle him to address proper experimental design. The practical part involves the application of a software tool for solving various problems raised as examples.
The second part is eminently practical and aims to facilitate the acquisition of practical skills for data representation in the area of biomedical sciences, and process modeling using linear and nonlinear regression. After entering the basic concepts, learning is based on the resolution of practical cases by appropriate software tools. While learning is done on Excel, the objective is for students to understand the fundamental structure of these tools to enable self-learning with different programs.

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 is no registration restriction

COMPETENCES / LEARNING OUTCOMES

2138 - Master's Degree in Research in and Rational Use of Medicines

Be able to access the information required (databases, scientific articles, etc.) and to interpret and use it sensibly.

Be able to access to information tools in other areas of knowledge and use them properly.

Be able to make quick and effective decisions in professional or research practice.

Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.

Students should demonstrate self-directed learning skills for continued academic growth.

To be able to assess the need to complete the scientific, historical, language, informatics, literature, ethics, social and human background in general, attending conferences, courses or doing complementary activities, self-assessing the contribution of these activities towards a comprehensive development.

Utilizar adecuadamente las herramientas informáticas, métodos estadísticos y de simulación de datos, aplicando los programas informáticos y la estadística a los problemas biomédicos

DESCRIPTION OF CONTENTS

1. Applied Biostatistics

Descriptive methods. Probability and theoretical distributions. Inferential methods. Parameter estimation. Hypothesis Testing. Compliance testing. Comparison half half theoretical observed. Comparison of observed ratio to a theoretical ratio. Goodness of fit tests. Chi-square test. Kolmogorov-Smirnov. Tests independiencia between two variables. Comparison of two proportions. Analysis of contingency tables. Comparison of two means. Comparison of more than 2/2 (ANOVA). Regression. Correlation. Experimental designs. Analysis of survival. Introduction to multivariate analysis. Principal component analysis. Logistic Regression. Discriminant analysis. Analysis of "clusters".

Mathematical models. Optimization problems. Objective functions. Types of mathematical functions. Syntax of explicit functions in Excel. Linear Regression. Weighting. Comparing parameters. Nonlinear Regression. Simultaneous adjustment. Data Transformation. Obtaining initial estimates. Model

2. Computational methods for the analysis and presentation of data

comparison.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	10,00
Computer classroom practice	40,00
Total hours	**50,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	30,00
Preparation of lessons	55,00
Preparation for assessment activities	20,00
Resolution of case studies	0,00
Total hours	**105,00**

TEACHING METHODOLOGY

During the activities, both theoretical and practical, the applications of the subject contents in relation to the Sustainable Development Goals (SDG) will be indicated. This is intended to provide knowledge, skills and motivation to understand and address these SDGs, while promoting reflection and criticism.

Lectures, participatory lecture
Resolution of case studies
Problems

To complete the classroom hours, the materials provided for face-to-face teaching will be adapted, so that the student can access them at any time. Use of the virtual classroom forum to answer questions. For the practical sessions of the theoretical content, the use of videoconferences and/or the realization of the proposed exercises would be combined using the \\\\"Task\\\\" option in the virtual classroom.

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EVALUATION

Continuous assessment

Practical exam

Minimum rating: 5 points

Actividad	%
Classroom Assistance	50
Problems and Issues	25
Practical Examination	25

Evidence of copying or plagiarism in any of the assessable tasks will result in failure to pass the subject and in appropriate disciplinary action being taken. Please note that, in accordance with article 13. d) of the Statute of the University Student (RD 1791/2010, of 30 December), it is the duty of students to refrain from using or participating in dishonest means in assessment tests, assignments or university official documents.

In the event of fraudulent practices, the "**Action Protocol for fraudulent practices at the University of Valencia**" will be applied (ACGUV 123/2020): https://www.uv.es/sgeneral/Protocols/C83sp.pdf

REFERENCES

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