COURSE DATA

DATA SUBJECT

Code: 43080
Name: Data processing methods in physiology
Cycle: Master's Degree / Doctorate
ECTS Credits: 6
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2141 - Master's Degree in Physiology	Facultat de Medicina i Odontologia	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2141 - Master's Degree in Physiology	Methodology for research in physiology	COMPULSORY

COORDINATION

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SUMMARY

The realization of any investigation, such as those included in the field of Physiology, requires a series of steps, from the setting of the objectives to the verification of their achievement. Among them is the management and treatment of experimental data, which are those that, among others, are developed in this subject, for the correct obtaining of the results.

Therefore, the objectives of the subject are:

-Know the different steps to follow to carry out a scientific investigation and to present it as a scientific result.

-Acquire sufficient knowledge to allow the student, in their future research work, to carry out an adequate treatment of experimental data.

-Know the field of application and the proper use of the different statistical tests for a correct extrapolation from the sample information to that of the population.

-Fluently manage one of the most widely used statistical programs today, the SPSS v.17.

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 prerequisites for taking the subject.

COMPETENCES / LEARNING OUTCOMES

2141 - Master's Degree in Physiology

Assess the need to complete the scientific training, in languages, computer science, ethics, etc., attending conferences or courses and/or carrying out complementary activities, self-evaluating the contribution that the performance of these activities implies for their comprehensive training.

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

Be able to integrate new technologies in their professional and/or research work.

Differentiate between the statistical methods to carry out the correct data analysis and handle them in a practical context of an investigation, as well as adequately present the results.

Employ the basic tools for the treatment of experimental data in biomedical research.

Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.

Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.

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.

Students should possess and understand foundational knowledge that enables original thinking and research in the field.

To acquire a critical attitude that allows you to make reasoned judgments and defend them with rigor and tolerance.

DESCRIPTION OF CONTENTS

1. Scheme of conducting an investigation

The steps for conducting an investigation are described:
-Statement of objectives.
-Choice of a material and method to carry out the experiences.
-Data collection.
-Orientative assessment of the data.
-Data processing.
-Verification of the achievement of the stated objectives.

2. Scheme of presentation of a scientific work

-Title.
-Authors.
-Summary.
-Keywords.
-Introduction.
-Material and method.
-Results.
-Discussion.
-Conclusions.
-Thanks.
-Bibliography.
-Supplementary material.

3. Bibliographic reference manager

-Definition.
-Examples of bibliographic managers.
-Reference manager Zotero.

4. Calculation of errors in direct and indirect measurements

-Fundamental concepts.
-Error writing criteria.
-Classification of measures.
-Calculation of errors in direct measurements.
-Calculation of errors in indirect measures.

-General criteria.

5. Graphic representations

-General criteria.Choice of axes and scales.
Representation of errors.
Representative curve drawing.
Special scales.
-Linear regression.
-Estimation of the regression parameters: Comparison of slopes and ordinates.

6. Systematic reviews and meta-analysis. Publication of research studies

-Definitions.
-Sections.
-Methodology.
-Results presentation.
-Types of studies.
-How to publish a research study in an impact journal.

7. Analysis of data

-Checking the normality of a population.
Kolmogorov-Smirnov method.
-Estimation of population parameters. Robust estimators.
-Comparison of means and proportions.
Use of statistics: Z, t-Student.
-Acceptance and rejection of hypotheses.
-Analysis of categorizable data.
Contingency tables, Chi-square.
-Comparison of 3 or more means. ANOVA.

8. Use of the SPSS statistical package

Practical resolution of exercises.

9. Carrying out an experience and presentation as scientific work

A laboratory experience will be carried out showing the different sections of a research work and the presentation of it as a scientific work will be prepared.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	4,00
Theory	33,00
Other activities	0,00
Laboratory	3,00
Total hours	**40,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	2,00
Individual or group project	24,00
Independent study and work	32,00
Preparation of lessons	10,00
Preparation for assessment activities	22,00
Resolution of case studies	20,00
Total hours	**110,00**

TEACHING METHODOLOGY

- Theoretical classes with active alumni participation.

- Classes of problems related to the subjects.

- Classes in the computer room to handle the necessary computer tools for solving problems.

- Practical laboratory classes, including introductory seminars, conducting internships with the teacher follow-up and support, and redaction of a written memory or written test.

- Debated and directed discussion on the work and practices carried out.

- Face-to-face and electronic tutoring with teachers.

EVALUATION

Evaluation system:

- Written exam consisting of exercises similar to those carried out in the classes: evaluation up to 7 points.

- Memory of experience in scientific article format: evaluation up to 3 points.

Attendance at the laboratory experience session is compulsory.

Minimum passing grade: 5 points.

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