COURSE DATA

DATA SUBJECT

Code: 34167
Name: Mathematic statistics
Cycle: Undergraduate Studies
ECTS Credits: 9
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1107 - Degree in Mathematics	Facultat de Ciències Matemàtiques	3	Second quarter
1928 - Double Degree Program Physics-Mathematics	Facultat de Ciències Matemàtiques	5	First quarter
1935 - Double Degree Program in Mathematics-Telematics Engineering	Facultat de Ciències Matemàtiques	3	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1107 - Degree in Mathematics	Probability and statistics	COMPULSORY
1928 - Double Degree Program Physics-Mathematics	Quinto Curso (Obligatorio)	COMPULSORY
1935 - Double Degree Program in Mathematics-Telematics Engineering	Tercer curso	COMPULSORY

COORDINATION

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PALMI PERALES FRANCISCO

SUMMARY

This course aims to deepen the basic concepts of statistical inference. This concepts were presented in the Basic Statistics course. Thus, from the hand of Probability Theory, you will know the foundation of basic concepts and techniques of estimation (point and confidence intervals) and hypothesis testing.

An additional purpose, which has this course is to prepare students for the start in statistical modeling.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

You should have completed the courses Basic Statistics (semestre 1) and Probability (semestre 5 or 7).

COMPETENCES / LEARNING OUTCOMES

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Ability to work in teams.

Adapting to new situations.

Apply the knowledge in the professional world.

Argue logically in decision-making.

Capacity for criticism.

Capacity for organization and planning.

Capacity of abstraction and modeling.

Expressing mathematically in a rigorous and clear manner.

Participate in the implementation of software and learn mathematical software.

Possess and understand the mathematical knowledge.

Reason logically and identify errors in the procedures.

Solve problems that require the use of mathematical tools.

DESCRIPTION OF CONTENTS

1. Random samples and distributions of the statistics

1.1 Basic concepts.
1.2 Distributions of the statistics.
1.3 Convergence.

1.4 Random samples and sampling distribution.

2. Principles of data reduction

2.1 Sufficiency principle.
2.2 Likelihood principle.

2.3 Fisher's information

3. Estimation

3.1 Point estimation.
3.2 Methods of evaluating point estimators.
3.3 Interval estimation.

4. Hypothesis testing

4.1 Methods of finding tests.
4.2 Methods of evaluating tests.
4.3 Hypothesis testing and interval estimation.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	45,00
Other activities	11,00
Computer classroom practice	34,00
Total hours	**90,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours

Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	73,00
Preparation of lessons	42,00
Preparation for assessment activities	10,00
Resolution of case studies	10,00
Total hours	**135,00**

TEACHING METHODOLOGY

The content of each topic will be introduced and developed in the theoretical classes. In the practical classes and seminars, the concepts exposed in theoretical classes will be applied using software of statistical analysis or solving problems and questions.

Several assignments will be proposed to the students where they will use the techniques learned in the theoretical classes.

EVALUATION

Theory and practice. Knowledge will be assessed jointly worked on the theory sessions and in practice. This evaluation was conducted in two stages:

a) **Evaluation of the knowledge acquired in the practice sessions**. This evaluation will represent **20% of the final grade**.

b) **Evaluation of the knowledge acquired in the seminar and theoretical sessions**. This evaluation will mean **20% of the final grade**.

c) **Evaluation of all the topics presented in this course**. It consists of a theoretical-practical individual test. This evaluation will involve **60% of the final grade**. In order to average with scores obtained in (a) and (b), the student must obtain a score greater or equal to 5 points (over 10) in this final exam.

The individual exam grade **(c)** can be retrieved in the second call of the subject, but the grades obtained in **(a)** and **(b)** correspond to the continuous assessment during the semester and can not be recovered: they are maintained for the second call.

The scores obtained in (a) and (b) are kept in the two calls of the academic year in which they are governed.

REFERENCES

- G. Casella, R.L.Berger.Statistical Inference.Duxbury Press,2002.

- M.A. Gómez. Inferencia Estadística. Díaz de Santos, 2005.
- M.H. Degroot. Probability and Statistics. Addison-Wesley, 2002.