

Biostatistics

Code: 100811
ECTS Credits: 6

Degree	Type	Year	Semester
2500251 Environmental Biology	FB	1	1

Contact

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Teaching groups languages

You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

Teachers

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Javier Retana Alumbros

Miquel Riba Rovira

Prerequisites

No specific prerequisites are required for this subject.

Objectives and Contextualisation

This subject is an introduction to statistics. Its objective is to transmit its usefulness in the analysis of data and the design of experiments and, to show which are the most appropriate tools according to the objectives of the study and the available data.

Competences

- Apply ICT resources pertaining to this field of study.
- Apply knowledge of theory to practice.
- Design models of biological processes.
- Display basic knowledge of mathematics, physics and chemistry.
- Obtain information, design experiments and interpret results.
- Reason critically.
- Solve problems.

Learning Outcomes

1. Apply ICT resources pertaining to this field of study.
2. Apply frequency distributions to determine levels of statistical significance.
3. Apply knowledge of theory to practice.
4. Apply the concept of null hypothesis.
5. Distinguish between continuous, discrete and categorical variables.
6. Distinguish between dependent and independent variables of an explanatory mathematical model.
7. Formulate conceptual models mathematically.
8. Identify and distinguish between the statistical analyses needed to test hypotheses.
9. Interpret the results of the statistical analyses and apply them to the hypothesis testing.
10. Obtain information, design experiments and interpret results.
11. Reason critically.
12. Solve problems.
13. Synthesise quantitative data series in the form of tables and graphs.
14. Understand and apply the concept of statistical probability .
15. Understand and apply the concepts of mean and variability.

Content

1. DESCRIPTIVE STATISTICS
2. INTRODUCTION TO PROBABILITY
3. RANDOM VARIABLES
4. DISCRETE AND CONTINUOUS PROBABILITY DISTRIBUTIONS
4. INTERVAL ESTIMATION
5. STATISTICAL TESTS

Methodology

To reach the contents of this subject it will be necessary to follow both the directed activities (master classes, problems and practices with computers) and the work of individual study outside the classroom.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master class	29	1.16	15, 14, 5, 6, 7, 8, 9, 11

Practices with computer	15	0.6	4, 3, 2, 1, 15, 14, 5, 6, 8, 9, 10, 11, 13
Resolution of exercises	10	0.4	4, 3, 2, 15, 14, 5, 6, 8, 11, 12, 13
Type: Supervised			
Fulfillment of assignments	16	0.64	4, 3, 2, 1, 15, 14, 5, 6, 8, 9, 11, 12, 13
Tutorship	4	0.16	3, 9, 11
Type: Autonomous			
Study	71	2.84	4, 3, 1, 6, 8, 9, 12

Assessment

Students will be evaluated according to the following guidelines:

- 1) The homework counts for 10% of the total grade.
- 2) Practical computer sessions count for 35% of the final grade.
- 3) Mid term exam: 25% of the final grade.
- 4) Final Exam: 35% of the final grade.

Students with a score < 5 (after 1,2,3,4), and only these students, may attend the reevaluation exam if they have been evaluated in at least two thirds of the activities. Then, the grade of this exam will replace that of the mid-term and final exams. Activities 1 and 2 cannot be re-evaluated.

Students not attending 50% of all evaluation activities will get the mark "Not assessable".

Guidelines for students in "unique global evaluation":

1. There will be the same three types of evaluations: exam, homework and computing.
2. Exams: There will be a single final exam including the full content of the course.
3. Homework: The student will be asked to make an oral presentation of one of the exercises that have been worked out in the problem sessions of the course.
4. Computing: The student will be asked to solve some statistical problems using the computer software taught in the practical sessions.
5. All these evaluation procedures will take place the same day of the final exam.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Computational statistics exam	30%	1	0.04	3, 1, 9, 10, 11
Final exam	35%	2	0.08	4, 3, 2, 15, 14, 5, 6, 7, 8, 9, 11, 12, 13
First exam	25%	2	0.08	3, 2, 15, 14, 5, 7, 11, 12, 13
Homework	10%	0	0	4, 3, 8, 9, 12

Bibliography

- 1. Delgado, R. Probabilidad y Estadística para ciencias e ingenierías, Editorial Delta, 2008.
- 2. Bardina, X., Farré, M. Estadística descriptiva, Manuals UAB, 2009.
- 3. Devore, Jay L. Probabilidad y Estadística para ingeniería y ciencias, International Thomson Editores, 1998.
- 4. Milton. J. S. Estadística para Biología y Ciencias de la Salud, Interamericana de España, McGraw-Hill, 1994.
- 5. Moore, D. S. Estadística aplicada básica, Antoni Bosch editor, 2000.

Software

Statistical software R and R Studio