Asignatura: Biostatistics
Código: 32772
Centro: Facultad de Ciencias
Titulación: Master Degree in Inland Water Quality Assessment
Tipo: optativa
Nº de créditos: 4

1 de 4

ASIGNATURA / COURSE TITLE

BIOESTADÍSTICA/ BIOSTATISTICS

1.1.   Código / Course Lumber

32772

1.2.   Materia / Content area

This course is elective and is not included in any higher rank area within the master

1.3.   Tipo / Course type

Elective subject

1.4.   Nivel / Course level

Master

1.5.   Curso / Year

1st

1.6.   Semestre / Semester

2nd (Spring semester)

1.7.   Idioma / Language

English

1.8.   Requisitos previos / Prerequisites

Basic knowledge in statistics is recommended

1.9.   Requisitos mínimos de asistencia a las sesiones presenciales / Minimum attendance requirement

Attendance is highly advisable

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2 de 4

1.10. Datos del equipo docente / Faculty data

Coordinator: Ana Justel
Departamento de Matemáticas
Facultad de Ciencias
Despacho 207-B Módulo 8 (Edificio de Ciencias)
Teléfono / Phone: +34 91 4977067
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1.11. Objetivos del curso / Course objectives

The student will get knowledge about the selection of appropriate statistical method to manage, compare and present his data. The aim is to teach the students how to have the ability to ensure their studies and their results.

1.12. Contenidos del programa / Course contents

Syllabus

1. Descriptive statistics for multivariate data: mean and variability in a data matrix. Graphics for water quality data analysis: scatter matrixplot, multiple box-plot and star plot.

2. Cluster analysis: k-means and hierarchical methods. Proximity for quantitative and qualitative variables. Group link criteria. Dendrogram.

3. Discriminant analysis: Fisher method. Classification evaluation. Prior and cost information incorporation. Other classification methods as logistic regression, CART and nearest neighbors.

4. Dimension reduction: PCA computation and criteria for selecting the number of components. Factorial model, rotation, factorial scoring. Multidimensional scaling. Correspondence analysis.

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1.13. Referencias de consulta / Course bibliography

Main references

- Barnett, V. (2004). Environmental Statistics: Methods and Applications. John Wiley.
- Davis, Ch. (2008). Ground Water Monitoring Statistics and Regulations (Applied Environmental Statistics) (Ring-bound). Chapman & Hall/CRC
- Greenacre, M. y Primicerio R. (2013). Multivariate Analysis of Ecological Data. Fundación BBVA.
- Lattin, J.M., Carroll, J.D. y Green, P.E. (2003). Analyzing multivariate data. Thomson Brooks/Cole.
- Manly, B.F.J. (2005). Multivariate Statistical Methods: A Primer. Chapman & Hall/CRC.
- Mc Garigal, K., Cushman, S. and Stafford, S. (2000). Multivariate statistics for wildlife and ecology research. Springer-Verlag.
- Townend, J. (2002). Practical Statistics for Environmental and Biological Scientists. Wiley.

2. Métodos docentes / Teaching methodology

1. Lectures
2. Seminars and practical classes
3. Computer lab
4. Office hours, including online

3. Tiempo de trabajo del estudiante / Student workload

		Hours	Percentage
Attendance	*Lectures*	16	32 %
	Case studies in computer lab	14	
	Exams	2	
Non-attendance	*Exercises and essays preparation*	43	68 %
	Exams preparation	25	
Total amount of work measured in hours		**100**	

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4. Métodos de evaluación y porcentaje en la calificación final / Evaluation procedures and weight of components in the final grade

Written exams (40%)

Exercises and written essays (60%)

Any student that participated less than 10% of evaluable activities will be qualified as "unevaluated".

In the case that the student does not obtain the minimum requirements for passing the course (see evaluation section) will have another opportunity in the same conditions.

5. Cronograma* / Course calendar

WEEK	
1	Lesson 1: Lectures, Exercises, Case studies
2-3	Lesson 2: Lectures, Exercises, Case studies
4	Lesson 3: Lectures, Exercises, Case studies
5	Lesson 4: Lectures, Exercises, Case studies
6	Exam

*Este cronograma tiene carácter orientativo.