

COURSE PROGRAM

Academic year: 2026/2027

Identification and characteristics of the course				
Code	401358		Créditos ECTS	6
Course name (Spanish)	Análisis de datos aplicado a la investigación en ciencias del deporte			
Course name (English)	Data analysis applied to research in sport sciences			
Master program	Master in health promotion using the physical activity			
Semester	2	Type of the course	Optional	
Module				
Matter				
Lecturer/s				
Name		Office	E-mail	Web page
Jorge Pérez		315	Jorgepg100@unex.es	
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Subject Areas	Physical and Sport Education ⁽¹⁾ Statistics and Operations Research ⁽²⁾			
Departments	Didáctica de la Expresión Musical, Plástica y Corporal ⁽¹⁾ Matemáticas ⁽²⁾			
Coordinating Lecturer	Jorge Pérez			

Competencies
Basic Competencies CB6. To have knowledge and understanding that provide a basis or opportunity for originality in developing and/or applying ideas in a research context. CB7. To apply the knowledge acquired to solve problems in new or unfamiliar environments, within broader (or multidisciplinary) contexts related to their area of study. CB8. To integrate knowledge and address the complexity of formulating judgments based on information that is incomplete or limited, including reflection on the social and ethical responsibilities linked to the application of their knowledge and judgments. CB9. To communicate their conclusions—and the knowledge and rationale behind them—to both specialized and non-specialized audiences in a clear and unambiguous manner. CB10. To possess the learning skills necessary to enable autonomous, self-directed study. General Competencies CG1. To understand the objectives of Physical Activity and Sport within the health sector. CG2. To acquire a scientific foundation applicable to Physical Activity and Sport across all health-related fields. CG7. To develop critical thinking skills for describing, analyzing, and understanding social and sport phenomena within the health sector. CG8. To promote and evaluate the development of lasting and autonomous habits of physical activity and sport practice in health-related contexts.

Transversal Competencies

- CT1.** To be familiar with and use scientific literature in physical activity and sport, with a focus on health promotion.
- CT2.** To apply information and communication technologies in the field of Physical Activity and Sport, with an emphasis on health promotion.
- CT3.** To develop leadership, interpersonal, and teamwork skills, primarily within the field of physical activity.
- CT4.** To develop competencies for solving new problems and fostering autonomous learning, mainly focused on physical activity and health.
- CT5.** To cultivate habits of excellence and quality in professional work, especially in the fields of physical activity and health.
- CT6.** To work according to ethical and deontological principles, particularly in the field of physical activity.
- CT7.** To promote gender equality in the fields of physical activity and health.
- CT8.** To promote equal opportunities for people with disabilities.
- CT9.** To promote equality by treating people fairly and without bias.
- CT10.** To be aware of the impact of physical activity and/or sport practice.
- CT11.** To understand the importance of physical activities as key components of leisure and tourism.
- CT12.** To design, develop, present, and defend reports related to the professional profile.
- CT14.** To generate original ideas in professional or research contexts.
- CT15.** To apply knowledge to solve new problems in interdisciplinary contexts.
- CT16.** To develop ideas based on incomplete information.
- CT17.** To communicate conclusions to both specialized and non-specialized audiences.
- CT18.** To use skills that facilitate autonomous learning.

Specific Competencies

- CE030.** To understand and apply classical statistical methods in the context of Sport Science.

Contents

Description

Data analysis applied to research in Sport Sciences

Lessons

Lesson 1: **The normal distribution**

The normal distribution
Normality test

Activities description: To conduct different normality tests using the software R

Lesson 2: **Analysis of variance**

Analysis of variance for independent samples
Analysis of variance for dependent samples
Analysis of variance for independent and dependent samples
Analysis of Covariance

Description of the activities: Analysis of variance and covariance using the software R.

Lesson 3: Nonparametric tests

Chi-square test

Wilcoxon test.

U Mann Whitney test

Kruskall-Wallis test

Description of the activities: To perform nonparametric tests using the software SPSS

Lesson 4: Regression and correlation

Linear correlation

Pearson correlation coefficient

Linear regression

Description of the activities: To solve regression and correlation problems using the software SPSS

Educational activities ¹												
		face-to-face activities (AP)					Virtual Activities (AV)					
LESSON	TOTAL	GG	CH	L	O	S	CST	CSP	CAT	CAP	TP	TA
1	25	1.5			1				4	4	2	13
2	49	6			2				5	5	3	27
3	50	4			2				12		3	29
4	24	3			1				7.5		2	11
Assessment	2	1			1							
Total	150	15.5			7				28.5	9	10	80
		40 % face-to-face activities					60 % Virtuality					

face-to-face activities (AP)	Virtual Activities (AV)
Activities that take place in a single physical space and involve physical interaction between students and teachers: GG: Large Group (85 students). CH: Hospital clinical practice activities (7 students). L: Laboratory or field practice activities (15 students). O: Activities in a computer lab or language lab (20 students). S: Seminar or problem-solving activities in class (40 students).	Activities that do not take place in a shared physical space. They can be synchronous (involving student/teacher interaction) or asynchronous: CST: Synchronous theoretical class. CSP: Synchronous practical class. CAT: Asynchronous theoretical class. CAP: Asynchronous practical class.
– TP: Scheduled Tutoring (tutoring, ECTS tutoring). – TA: Independent student work.	

Teaching methodologies
A. Expository method. The teacher presents the subject's content to the students. B. Practical problem solving. Students solve practical questions using appropriate software in the computer laboratory.
Learning outcomes*
Understanding classical statistical methods
Assessment systems
Each student must select their preferred evaluation method—either continuous evaluation or final evaluation—within the first four weeks of the semester. They may also change their chosen method during a second period, which begins on the first day of the June exam review period and lasts for seven calendar days. Students who do not make a selection during this second period will retain the same evaluation method used in the previous ordinary assessment.

¹ Actividades formativas con contenido en ECTS y tiempo de dedicación del estudiante.

Continuous evaluation

The evaluation tools are the following.

Part A. Lessons 1 and 2

1. Final test (50% of part A grade). A comprehensive test. Recoverable activity.
2. Continuous evaluation (50% of part A grade). Completion of individual assignments (50% of part A grade). Non-recoverable activity

Part B. Lessons 3 and 4

1. Final test (50% of part B grade). A comprehensive test. Recoverable activity.
2. Continuous assessment (50% of the part B). Completion of individual assignments. Non-recoverable activity

Under this evaluation method, the final grade is the average of Part A and Part B if each part's grade is at least 3 out of 10. If the grade for one or both parts is below 3, the student fails the subject, and the final grade is the minimum of the grades for the two parts

Final evaluation

The evaluation tools include the following.

Part A. Lessons 1 and 2

Final examen (100% part A grade)

Part B. Lessons 3 and 4

Final exam (100% part B grade).

According to this evaluation method, the final grade for the subject is calculated as the average of the grades for Part A and Part B, as long as both are equal to or greater than 3 out of 10. If either part receives a grade below 3, the student fails the subject, and the final grade will correspond to the lowest grade obtained in either part.

Bibliography (basic and complementary)

Basic references

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Kwartler T. (2022) *Sports analytics in practice with R*. John Wiley & Sons.

Newell,J., Aitchison T. Grant S. (2010) *Statistics for sports and exercise science: A practical approach*, Pearson Education Ltd.

O'Donogue, P (2012). Statistics for sport and exercise studies: an introduction, Routledge.

Pardo A., San Martín R. (2009) Análisis de datos en ciencias sociales y de la salud I. Editorial Síntesis.

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Pérez López, C. (2001). Técnicas estadísticas con SPSS. Prentice Hall.

Severini, T.A. (2014) Analytic Methods in Sports: Using Mathematics and Statistics to Understand Data from Baseball, football, Basketball and other Sports, CRC Press.

Verzani J. (2014) Using R for introductory statistics. CRC Press.

Complementary references

Cohen, B.H. (2001). Explaining psychological statistics. New York: John Wiley & Sons.

DeGroot, M. H. (1988). Probabilidad y estadística. Addison-Wesley Iberoamericana.

Martín Andrés, A. y Luna del Castillo, J.D. (1999). Bioestadística para las ciencias de la salud. Norma. (3ª ed.)

Remarks Adaptation to Royal Decree 822/2021

This document, 12A, identifies the following links and/or adaptations to Royal Decree 822/2021, based primarily on its connection to different Sustainable Development Goals (SDGs), in the following sections:

Linking of competencies, content blocks, and topics with the SDGs:

COMPETENCIAS VINCULADAS AL ODS		Bloque/s de Contenidos o Tema/s vinculados con el ODS marcado	COMPETENCIAS VINCULADAS AL ODS		Bloque/s de Contenidos o Tema/s vinculados con el ODS marcado
					
					
					

CB1 CB2 CB3 CB4 CB5 CG2 CT5 CT6	4 EDUCACIÓN DE CALIDAD 	Lessons 1,2, 3 and 4	13 ACCIÓN POR EL CLIMA 	
	5 IGUALDAD DE GÉNERO 		14 VIDA SUBMARINA 	
	6 AGUA LIMPIA Y SANEAMIENTO 		15 VIDA DE ECOSISTEMAS TERRESTRES 	
	7 ENERGÍA ASEQUIBLE Y NO CONTAMINANTE 		16 PAZ, JUSTICIA E INSTITUCIONES SÓLIDAS 	
	8 TRABAJO DECENTE Y CRECIMIENTO ECONÓMICO 		17 ALIANZAS PARA LOGRAR LOS OBJETIVOS 	
	9 INDUSTRIA, INNOVACIÓN E INFRAESTRUCTURA 			