

## TEACHING PLAN OF THE SUBJECT

**Academic year: 2022/2023**

Identification and characteristics of the subject			
Code	401574	ECTS credits	
Title (English)	Data analysis applied to research in sports training		
Qualifications	Master's Degree in Initiation and Performance in Sport		
Centre	Faculty of Sports Science		
Semester		Character	Optional
Module	Research methods in sports science		
Subject	Research applied to sports training		
Teacher(s)			
Name	Office	E-mail	Website
Tomás García Calvo	309	<a href="mailto:tgarcia@unex.es">tgarcia@unex.es</a>	
Inmaculada Torres	Deanery	<a href="mailto:inmatorres@unex.es">inmatorres@unex.es</a>	
Area of knowledge	Physical Education and Sport <sup>(1)</sup> Statistics and Operations Research <sup>(2)</sup>		
Department	Didactics of Musical, Plastic and Bodily Expression <sup>(1)</sup> Mathematics <sup>(2)</sup>		
Coordinating teacher	Inmaculada Torres		

Competences *
<b>General Competencies</b>
<p>CG1. Manage tools (bibliographic, computer, laboratory) to develop with guarantees their research in the field of Sports Sciences.</p> <p>GC2. Analyse the scientific bibliography in a field of study of Sports Sciences.</p> <p>GC3. Produce scientific work in a field of study of Sports Sciences.</p> <p>GC4. Understand the scientific method and the scientific-technological systems of Extremadura, Spain and Europe.</p> <p>GC5. Develop and use active methodologies for the transmission of scientific knowledge on Sport Sciences, and debate about them.</p> <p>GC6. Analyse the lines of research in Sport Sciences and capacity for research interaction with them.</p>
<b>Core competences</b>
<p>CB6. Possess and understand knowledge that provides a basis or opportunity for originality in the development and/or application of ideas, often in a research context.</p> <p>CB7. Students must be able to apply their acquired knowledge and problem-solving skills in new</p>

\*The sections relating to competences, brief description of the content, training activities, teaching methodologies, learning outcomes and assessment systems must comply with the contents of the degree's verified report.

or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.

CB8. Students are able to integrate knowledge and face the complexity of making judgements based on incomplete or limited information, including reflections on the social and ethical responsibilities linked to the application of their knowledge and judgements.

CB9. Students are able to communicate their conclusions and the ultimate knowledge and rationale behind them to specialist and non-specialist audiences in a clear and unambiguous way.

CB10. Students possess the learning skills that will enable them to continue studying in a largely self-directed or autonomous manner.

### **Cross-cutting competences**

CT1. Apply and use scientific literature in other languages of significant presence in the scientific field, preferably in English.

CT2. Analyse and apply information and communication technologies (ICT).

CT3. Generate leadership, interpersonal and teamwork skills.

CT4. Develop competences for adapting to new situations and problem solving and for autonomous learning.

CT5. Create habits of excellence and quality in professional practice, as well as acting within ethical and deontological principles.

CT6. Promote an egalitarian attitude towards rights and opportunities between men and women, as well as respect for the universal accessibility of disabled people and awareness of democratic values and a culture of peace.

CT7 To develop critical thinking in students as a means of enhancing innovation, creativity and the development of positive attitudes towards social justice.

CT9. Foster personal attitudes that favour scientific research.

## **Contents**

### **Brief description of the content**

### **Subject contents**

#### **Title of theme 1: The normal distribution**

Contents of theme 1: The normal distribution

Normality contrasts

Description of the practical activities for topic 1: Performing normality tests using R software

#### **Title of theme 2: Analysis of Variance**

Contents of topic 2: Analysis of variance assumptions

Analysis of variance for dependent samples

Ancova

Description of the practical activities of topic 2: Analysis of variance for both independent and dependent samples using R software. Introduction to Ancova using R.

#### **Title of theme 3: Mediation and Moderation Analysis**

Contents of topic 3: Introduction to Mediation and Moderation.

Single, multiple and moderated mediation models.

Description of the practical activities of topic 3: Applications of Mediation and Moderation analysis. Development of different types of models with PROCESS.

#### **Title of theme 4: Multilevel Mixed Models.**

Contents of topic 4: Analysis with ranked samples.

Mixed models with cross-sectional and longitudinal samples.

Description of the practical activities of topic 4: Multilevel mixed model analysis with SPSS. Longitudinal analysis with Mixed Models.

Title of theme 5: **Structural Equation Modeling**

Contents of topic 5: Introduction to structural equation analysis. ESEM and Path Analysis.

Description of the practical activities of topic 5: Modelling with AMOS software and its application in a sport context.

### Training activities

Hours of student work per subject		Theoretical hours	Practical activities				Follow-up activity	Non-attendance
Theme	Total		GG	PCH	LAB	ORD		
1	25	1.5			1			20.5
2	49				2.75			37.25
3	25	2.5			1.25		1.5	19.75
4	25	2.5			1.25		1.5	19.75
5	25	2.5			1.25			19.25
<b>Evaluation*</b>		1						
<b>TOTAL ECTS</b>		150			7.5			116.5

GG: Large Group (100 students).

HCP: hospital clinical internships (7 students)

LAB: laboratory or field practicals (15 students)

ORD: computer room or language laboratory internship (30 students)

SEM: problem classes or seminars or case studies (40 students).

TP: Programmed Tutorials (teaching follow-up, ECTS type tutorials).

PD: Personal study, individual or group work, and reading of bibliography.

### Teaching methodologies

A. Expository method consisting of the teacher's presentation of the contents of the subject being studied.

B. Solving practical questions using appropriate software in the computer laboratory.

\*\*Indicate the total number of hours of evaluation for this subject.

## Learning outcomes

That the student acquires a scientific attitude in relation to the study of Physical Activity and Sport Sciences, being able to reflect and make decisions with scientific rigour.  
Students solve a case specific to each of the methodological modules in the study of Physical Activity and Sport Sciences.

## Evaluation systems

In accordance with the provisions of the Regulations on Assessment of learning outcomes and competences acquired by students in the official degrees of the University of Extremadura, art. 4.6, **"the choice between the continuous assessment system or the assessment system with a final global test corresponds to the student during the first quarter of the course. The student will communicate to the teacher through the virtual campus the type of assessment selected. When a student does not make this communication, it will be understood that he/she chooses the continuous assessment"**.

Once the type of assessment has been chosen, the student may not change it in the ordinary call of that semester and will abide by the assessment regulations for the extraordinary call.

For students who choose the continuous assessment system, the assessment instruments, together with their respective weightings, will be as follows

Block 1. Themes 1 and 2

1. Final test (50% of the block mark). Performance of a global test. Recoverable activity.
2. Continuous assessment (50% of the block mark). Completion of individual homework (not a recoverable activity).

Block 2. Themes 3, 4 and 5

1. Final test (50% of the block mark). Performance of a global test. Recoverable activity.
3. Continuous assessment (50% of the block mark). Completion of individual assignments (this activity is not recoverable).

In order to pass the subject following the continuous assessment system, it will be necessary that the final mark for the subject, taking into account the above weightings, exceeds five points in each of the two blocks. The final mark will be the arithmetic mean of the marks obtained in blocks 1 and 2. If in only one block the mark of 5 points is not exceeded, the final mark will be the mark obtained in the block not passed. If the mark of 5 points is not exceeded in both blocks, the final mark will be the arithmetic mean of the marks obtained in both blocks.

For students who opt for the single final assessment system, the assessment instruments will be

Block 1. Themes 1 and 2

1. Final test (100%) Pass a comprehensive final test.

Block 2. Themes 3, 4 and 5

1. Final test (100%) Pass a comprehensive final test.

In order to pass the course following the final assessment system, the final mark of the final exam must be higher than five points in each of the two blocks. The final mark will be the arithmetic mean of the marks obtained in blocks 1 and 2. If in only one block the mark of 5 points is not exceeded, the final mark will be the mark obtained in the block not passed. If the mark of 5 points is not exceeded in both blocks, the final mark will be the arithmetic mean of the marks obtained in both blocks.

## Bibliography

### Basic references

Byrne, B. M. (2009). Structural equation modeling with AMOS: Basic concepts, applications, and programming: CRC Press.

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Pardo A., San Martín R. (2010) Análisis de datos en ciencias sociales y de la salud II. Editorial Síntesis

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). Probability and statistics. Addison-Wesley Iberoamericana.

Heck, R. H., Thomas, S. L., & Tabata, L. N. (2013). Multilevel and longitudinal modeling with IBM SPSS. Routledge.

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Martín Andrés, A. and Luna del Castillo, J.D. (1999). Biostatistics for health sciences. Norma (3rd ed.)

Pérez López, C. (2001). Statistical techniques with SPSS. Prentice Hall.

**Other complementary teaching resources and materials**