

TEACHING PLAN OF THE SUBJECT

Academic year: 2024/2025

Identification and characteristics of the subject			
Code	401574	ECTS credits	6
Title (English)	Data analysis applied to sports training research		
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	
Tomás García Calvo	309	tgarcia@unex.es	
Inmaculada Torres	Decanato	inmatorres@unex.es	
Area of knowledge	Physical Education and Sport ⁽¹⁾ Statistics and Operations Research ⁽²⁾		
Department	Didactics of Musical, Plastic and Bodily Expression ⁽¹⁾ Mathematics ⁽²⁾		
Coordinating teacher	Inmaculada Torres		

Competences *
General Competencies
CG1. Manage bibliographic, computer and laboratory tools to ensure the successful development of their research in the field of Sports Sciences.
GC2. Analyze the scientific literature in a specific field of Sports Sciences.
GC3. Produce scientific work in a specific field of Sports Sciences.
GC4. Understand the scientific method and the scientific-technological systems of Extremadura, Spain and Europe.
GC5. Develop and use active methodologies for the dissemination of scientific knowledge on Sport Sciences, and engage in debates about them
GC6. Analyse research lines in Sport Sciences and develop the capacity for research interaction with them.
Basic competencies
CB6. Acquire and understand knowledge that provides a foundation or opportunity for originality in the development and/or application of ideas, often in a research context.
CB7. Students must be able to apply their acquired knowledge and problem-solving skills in new

*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 can 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 can communicate their conclusions, along with the knowledge and rationale behind them, to both 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 competencies

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

TC2. Analyze and apply information and communication technologies (ICT).

CT3. Develop leadership, interpersonal and teamwork skills.

CT4. Develop competencies for adapting to new situations, problem-solving and autonomous learning.

TC5. Establish habits of excellence and quality in professional practice, while adhering to ethical and deontological principles.

CT6. Promote egalitarian attitudes towards rights and opportunities between men and women, while fostering respect for the universal accessibility of people with disabilities and raising awareness of democratic values and a culture of peace.

CT7. Foster critical thinking in students to enhance innovation, creativity, and the cultivation of positive attitudes towards social justice.

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 favor scientific research.

The program of this subject links the marked competencies with the following democratic values and SDGs or Comprehensive Sustainability Criteria:

- Objective 3. Health and Well-being: CB7-CB10- CG1- CG5- CG7- CT2- CT5- CEEL1
- Objective 4. Quality Education: CB7- CB10- CG1- CG2-CG5- CG7- CT2- CT5- CT7- CEEL1
- Objective 5. Gender Equality: CT3- CT6
- Objective 10. Reduce Inequality Within and Among Countries: CT1-CT6

Contents

Brief description of the content

Data analysis applied to research in Sport Sciences

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: Conducting 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	CH	L	O	S	TP	EP
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
Evaluation *	1							
TOTAL ECTS	150				7.5			116.5
GG: Large Group (85 students). CH: Hospital clinical internships (7 students) L: laboratory or field practices (15 students) O: computer room or language laboratory internship (20 students) S: 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. The teacher presents the subject's content to the students. B. Solving practical questions using suitable software in the computer laboratory.								

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

Learning outcomes

Ensure the students acquire a scientific attitude towards the study of Physical Activity and Sport Sciences, enabling them to reflect and make decisions with scientific rigor.
Require students to solve a case specific to each methodological module in the study of Physical Activity and Sport Sciences.

Evaluation systems

Each student selects 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 and lasts for seven calendar days. Students who do not select the during this period will maintain the same evaluation method as their previous ordinary assessment

Continuous evaluation

The evaluation tools are the following.

Part A. Lessons 1 and 2

1. Final test (50% of part A grade). Performance of a global test. Recoverable activity.
2. Continuous evaluation (50% of the part A grade). Consists of completing individuals tasks each week (50% of the part A grade). Non-recoverable activity

Part B. Lessons 3, 4 and 5

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

Under this evaluation method, the final grade is the average of Part A and Part B if each part's grade is at least 5 out of 10. If the grade for one or both parts is below 5, 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, 4 and 5

Final exam (100% part B grade).

According to this evaluation method, the final grade of the subject is determined by averaging the grades of Part A and part B, provided each part's grade is above 5 out of 10. If the grade for one or both parts is below 5, the student fails the subject, and the final grade is the minimum of the grades for the two parts

Bibliography

Basic references

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Field, A. (2005). Discovering statistics using IBM SPSS Statistics. London: Sage Publications Ltd.

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Hayes, A. F. (2017). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. Guilford Publications.

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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.

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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