COURSE PROGRAM

Academic year: 2024/2025

<table>
<tr><td colspan="5" align="center">Identification and characteristics of the course</td></tr>
<tr><td>Code</td><td>401358</td><td>Créditos ECTS</td><td colspan="2">6</td></tr>
<tr><td>Course name (Spanish)</td><td colspan="4">Análisis de datos aplicado a la investigación en ciencias del deporte</td></tr>
<tr><td>Course name (English)</td><td colspan="4">Data analysis applied to research in sport sciences</td></tr>
<tr><td>Master program</td><td colspan="4">Master in health promotion using the physical activity</td></tr>
<tr><td>Semester</td><td>2</td><td>Type of the course</td><td colspan="2">Optional</td></tr>
<tr><td>Module</td><td colspan="4"></td></tr>
<tr><td>Matter</td><td colspan="4"></td></tr>
<tr><td colspan="5" align="center">Lecturer/s</td></tr>
<tr><td>Name</td><td>Ofiice</td><td colspan="2">E-mail</td><td>Web page</td></tr>
<tr><td>Jorge Pérez</td><td>315</td><td colspan="2">Jorgepg100@unex.es</td><td></td></tr>
<tr><td>Inma Torres</td><td>Decanato</td><td colspan="2">inmatorres@unex.es</td><td></td></tr>
<tr><td>Subject Area</td><td colspan="4">Physical and Sport Education[1]
Statistics and Operations Research[2]</td></tr>
<tr><td>Department</td><td colspan="4">Didáctica de la Expresión Musical, Plástica y Corporal[1]
Matemáticas[2]</td></tr>
<tr><td>Coordinating Lecturer</td><td colspan="4">Inmaculada Torres</td></tr>
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Competencies

Basic competencies

CB6. To have and understanding knowledge that provides a basis or opportunity to be original when performing/applying ideas in a research context.
CB7. To apply the knowledge acquired to solve problems in new or unknown 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, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.
CB9. To communicate their conclusions and the ultimate knowledge and reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way.
CB10. To possess the learning skills that enable students to study autonomously.

General competencies

CG1. To understand the objectives of Physical Activity and Sport in the health sector
CG2. To acquire a scientific background applied to Physical Activity and Sport in all health field.
CG7. To develop critical thinking skills in describing, analyzing, and understanding social and sport phenomena in the health sector.

CG8. To promote and evaluate the development of enduring and autonomous habits of physical activity and sport practice within the health sector.

Transversal competencies

CT1. To be familiar with and utilize scientific literature in physical activity and sports, with a primary focus on the health promotion sector.
CT2. To apply information and communication techniques in the field of Physical Activity and Sport, with a primary focus on the health promotion sector.
CT3. To develop leadership skills, interpersonal relationships and teamwork, primarily within the field of physical activity.
CT4. To develop competences related to solving new problems and fostering autonomous learning primarily focused on the fields of physical activity and health.
CT5. To cultivate habits of excellence and quality in professional work, with a primary focus on the fields of physical activity and health.
CT6. To work under ethical and deontological principles primarily focusing on the physical activity
CT7. To promote gender equality in the fields of physical activity and health
CT8. To promote equal opportunities focused on people with disabilities.
CT9. To promote equality of opportunities by treating people fairly and without bias
CT10. To be aware of the impact of practising physical activity and/or sport.
CT11. To understand the importance of physical activities as key elements of leisure and tourism
CT12. To design, develop, expose and defend reports related to the professional profile
CT14. To generate original ideas in professional or research settings.
CT15. To apply knowledge to solve new problems in interdisciplinary contexts.
CT16. To develop ideas based on incomplete information
CT17. To disseminate conclusions to both specialized and non-specialized audiences
CT18. To utilize skills to facilitate autonomous learning

Specific competencies

CE030. To understand and utilize classical statistical methods in the context of Sport Science

Contents

Description

Statistics Applied to Research in Sports Science. Experimental Design. Statistical and Qualitative Analysis in Sports Science

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

Student workload in hours by lesson		Lectures	Practical activities				Monitoring activity	Homework
Lesson	Total	L	HI	LAB	Lesson	Total	L	HI
1	25	1.5			1		2	20.5
2	49	6			2.75		3	37.25
3	50	4			2		3	41
4	24	3			1		2	18
Assessment **	2	1			1			
TOTAL	150	15.5			7.75		10	116.75

L: Lectures (85 students)
HI: Hospital internships (7 students)
LAB: Laboratory or field practices (15 students)
COM: Computer room or language laboratory practices (20 students)
SEM: Problem classes or seminars or case studies (40 students)
SGT: Scheduled group tutorials (educational monitoring, ECTS type tutorials)
PS: 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.

Learning outcomes*

Understanding classical statistical methods
Knowledge of research designs in various scientific disciplines applied to Sports Science

Assessment 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 include the following.

Part A. Lessons 1 and 2

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

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

Part B. Lessons 3 and 4

1. Theoretical and practical exam. (50% of part B grade)
2. Individual tasks Consists of completing individuals tasks each week (50% of the part B grade). 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 of the subject is determined by averaging the grades of Part A and part B, provided each part's grade is above 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

Bibliography (basic and complementary)

Basic references

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Cornillon P.A., Josse J., Guyader A., Kloareg M., Husson F., Matzner-Lober E., Jégou N., Rouvière L. (2012) R for statistics, CRC Press Chapman & Hall Book.

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.

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

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.)

Other resources and complementary educational materials

www.r-project.org: Webpage project R