1. BASIC INFORMATION

Course	Data Analysis
Degree program	Bachelor's Degree in Physical Activity and Sport Science
School	Faculty of Medicine, Health, and Sports
Year	First
ECTS	4 ECTS
Credit type	Required
Language(s)	English
Delivery mode	Campus-based
Semester	S1 and S2
Academic year	2025/2026
Coordinating professor	Iyán Iván Baragaño

2. PRESENTATION

The subject is oriented to the identification, understanding and management of the basic concepts of research design and statistics, within the framework of scientific research processes as well as in the framework of the interpretation and assessment of the scores obtained in different tests used. in the applied field.

From this perspective, the subject seeks to develop the skills that allow students to make objective interpretations of the numbers that are handled in this discipline as well as critical interpretations of research in Physical Activity and Sports Sciences.

Data analysis constitutes a tool that can be applied practically to any subject of the career, either for the interpretation of the data handled in that field/discipline or to be able to assess the scientific knowledge of it.In this subject, the student will be familiarized with statistical data analysis applied to the area of sports management.

3. SKILLS AND LEARNING OUTCOMES

Basic skills:

- BS1: Students show that they have and understand knowledge in a study area that is based on general secondary education, usually at a level that is obtained from advanced textbooks but also includes some aspects that suggest knowledge acquired at the forefront of their field of study.
- BS3: Students can gather and interpret relevant data (normally within their area of study) to issue opinions that include reflections on relevant social, scientific and ethical issues.
  BS5: Students have developed the necessary learning competencies to undertake higher studies with a high degree of independence.

Cross-curricular skills:

- CCS1: Autonomous learning: Ability to choose the strategies, tools, and moments you consider most effective for learning and independently implementing what you have learned.
- CCS13: Problem solving: Ability to find a solution to a confusing issue or a complicated situation without a pre-defined solution, which makes it more difficult to solve.
- CCS18: Use of information and communication technologies (ICT): Ability to effectively use information and communication technologies as a tool for searching, processing and storing information, as well as for developing communication skills.

Specific skills:

- SS2: Ability to convey attitudes and values in professional practice in all areas of physical activity and sports, contributing to the improvement of society.SC16: Capacity to use and interpret the technical and IT tools necessary for the effective and efficient management of a company.
- SS4: Ability to analyze and apply physiological, biomechanical, psychological and social principles to the different fields of physical activity, sports and recreation.
- SS6: Ability to assess physical fitness levels and motor skills, prescribing and programming health-oriented physical exercises at different ages.
- SS11: Ability to participate in society on the student's own terms, expressing a theoretical, academic, and professional discourse on physical activity and sport sciences.

Learning outcomes:

- LO1: The student is able to identify the fundamental bibliographical sources related to the field of physical activity and sport and identification of a scientific article structure.
- LO2: The student is able to understand fundamental concepts related to statistical and research techniques.
- LO3: The student is able to analyze and interpret the results of small descriptive empirical trials in the various areas of physical activity and sport and the results for the inference of conclusions

The following table shows the relationship between the competencies developed during the course and the learning outcomes pursued:

Competencies	Learning outcomes
BS1, BS5 CCS1, CCS18 SS2, SS11	LO1: The student is able to identify the fundamental bibliographical sources related to the field of physical activity and sport and identification of a scientific article structure.
BC1, BC3 CCS13 SS11	LO2: The student is able to understand fundamental concepts related to statistical and research techniques.
BC1, BC3, BC5 CCS13, CCS18 SS4, SS6	LO3: The student is able to analyze and interpret the results of small descriptive empirical trials in the various areas of physical activity and sport and the results for the inference of conclusions

4. CONTENT

This section indicates the content of each of the topics contained in the units of learning:

- The cientific method.
- Descriptive Statistics: Summarize, analyze and interpret data.
- Inference Theory: Approach to reality through tools for the acceptance or hypothesis rejection.

The subject is organized into four learning units, which, in turn, are divided into sections:

Learning Unit 1. Research and documentation methods.

Topic 1. Research methodology: scientific method and its phases, sources of information and documentation, methodological modalities, quality criteria and ethics in research.

Learning Unit 2. Introduction to Statistics

Topic 2. Introduction to statistics: definition, general concepts, variables, data collection methods and summation

Learning Unit 3. Descriptive statistics.

Topic 3. Data organization: data distribution and graphical representations
Topic 4. Descriptive statistics: measures of position, central tendency, dispersion and shape.

Learning Unit 4. Inferential statistics.

Topic 5. Two-dimensional distributions
Topic 6. Covariance. Correlation. Regression. Model rating.
Topic 7. Probability: Basic concepts, probability distributions, sampling distribution
Topic 8. Construction of confidence intervals. Parameter estimation.
Subject 9. Contrast of hypotheses and types of error.
Item 10. Tests to analyze the relationship between variables. Tests to analyze the difference between variables/groups.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Masterclasses.
- Problems resolution.
- Cooperative learning.

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
1 Campus classes: Analysis and resolution of practical cases	40 h
2 Autonomous work: Analysis and resolution of practical cases	27 h
3 Teamwork activities (seminaries, forum participation…)	10 h
4 Workshops and laboratories activities	5 h
5 Tutorials	4 h
6 Masterclasses	10 h
7 Asynchronous masterclasses	4 h
TOTAL	**100 h**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight
Activities	30% - 60%
Knowledge tests and exams	40% - 70%

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

7.1. First exam period

In general, the acquisition of skills by the student will be assessed through a continuous assessment system and, specifically, assessing the results obtained in the training and assessment activities designed for this purpose. The evaluation concludes with a test of knowledge about the level of learning achieved by the student and is expressed in numerical grades, in accordance with the provisions of current legislation.

To pass the subject in ordinary call you must obtain a grade greater than or equal to 5.0 out of 10.0 in the final grade (weighted average) of the subject.

7.2. Second exam period

To pass the course in the second exam period, you must obtain a final grade of at least 5 out of 10 (weighted average).

In any case, you will need to obtain a grade of at 5.0 in the final exam in order for it to count towards the final grade along with all the grades corresponding to the other activities.

The student must deliver the activities not successfully completed in the first exam period after having received the corresponding corrections from the professor, or those that were not delivered in the first place.

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Assessable activities	Deadline
Activity 1. Scientific article analysis and interpretation	Week 1-2
Activity 2. APA 7th	Week 2-3
Activity 3. Measures and variables	Week 5-6
Activity 4. Scientific articles analysis	Week 6-7
Activity 5. Pre-exam 1	Week 9-10
Activity 6. Excel-Jamovi-SPSS descriptive statistics	Week 9-10
Activity 7. Pre-exam 2	Week 15-16
Activity 8. Excel-Jamovi-SPSS inferential statistics	Week 15-16
Knowledge tests and exams	Week 9-10 Week 16-17

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. REFERENCES

The main reference work for this subject is:

Barriopedro, M. I. & Muniesa, C. (2012). *Análisis de datos en las ciencias de la actividad física y del deporte.* Pirámide.

The recommended Bibliography for this subject is:

Acosta, R. (2005). Gestión *y administración de organizaciones deportivas*. Paidotribo.

Biblioteca Dulce Chacón. (s.f.): Gestión bibliográfica. Recuperado el 21 de julio de 2022 de https://web-uem.bibliocrai.universidadeuropea.com/buscar-informacion-sobre/gestion-bibliografica

Botella, J. León, O., San Martín, R. & Barriopedro, M. I. (2003). Análisis de datos en Psicología I (4th ed.). Pirámide.

Desenti, J. T. & Rosenberg D. (1995). *Ethics in Sport Management*. Bookcrafters.

Griffith, A. (2010). *SPSS for dummies* (2nd ed.). Wiley Publishing.

Jiménez Villa, J., Argimón Pallàs, J. M., Martín Zurro, A. & Villardell Tarrès, M. (2015). *Publicación científica biomédica: cómo escribir y publicar un artículo de investigación* (2nd ed.). Elsevier.

Martín Andrés, A. & Luna del Castillo, J. D. (2004). Bioestadística para las Ciencias de la Salud (+) (5th ed.). Norma-Capitel.

Martínez González, M. A., Sánchez Villegas, A., Toledo Alucha, E. A. & Faulin Fajardo, J. (2014). *Bioestadística amigable* (3rd ed.). Elsevier.

Newel, J., Aitchison, T. & Grant, S. (2010). *Statistics for sports and exercise science: a practical approach*. Pearson Education.

Rumsey, D. J. (2013). *Estadística para dummies*. Planeta.

The recommended complementary bibliography for this subject is:

Alcaide, A. & Arenales, C. (1992). *Estadística, introducción* (3rd ed.). Universidad Nacional de Educación a Distancia.

Bunge, M. (1969). *La investigación científica*. Ariel.

Coll, S. & Guijarro, M. (1998). *Estadística aplicada a la historia y a las ciencias sociales*. Pirámide.

Harris, M. & Taylor, G. (2003). *Medical statistics made easy.* INFRMA-HC.

Kronos: La revista científica de actividad física y deporte. Recuperado el 21 de julio de 2022 de https://revistakronos.info/

Kuhn, T. S. (1987). *La estructura de las revoluciones científicas.* Fondo de Cultura Económica.

Peña, D. (1987). *Estadística: Modelos y métodos*. Alianza Editorial.

Popper, K. R. (1997). *La lógica de la investigación científica*. Tecnos.

San Martín, R. & Pardo, A. (1989). *Psicoestadística: contrastes paramétricos y no paramétricos*. Pirámide.

San Martín, R., Espinosa, L. & Fernández, L. (1986). *Psicoestadística descriptiva*. Pirámide.

San Martín, R., Espinosa, L. & Fernández, L. (1987). *Psicoestadística: estimación y contraste*. Pirámide.

Spiegel, M. (1991). *Estadística* (2n ed.). McGraw-Hill.

Scientific researches databases: (availables in https://web-uem.bibliocrai.universidadeuropea.com/)

- Academic Search Ultimate.
- Google Académico.
- Medline.
- Pubmed.
- Sport Discus.

Databases:

- Google Académico. Recurso disponible en https://scholar.google.es/.
- Instituto Nacional de Estadística. Recurso disponible en http://www.ine.es/dyngs/INEbase/listaoperaciones.htm.

- Sistema de Análisis de Balances Ibéricos (SABI). Recurso disponible en: http://biblioteca.uem.es/es/colecciones-bibliograficas/colecciones-formato/recursos-digitales/ciencias-sociales-y-comunicacion.

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

The Educational Guidance and Diversity Unit (ODI) provides comprehensive support to our students throughout their university life, assisting them in achieving their academic goals. Our main areas of focus include fostering inclusivity for students with specific educational support needs, ensuring universal accessibility across all university campuses, and promoting equal opportunities.

From the ODI Unit, students can benefit from the following services:

1. Personalized Accompaniment and Follow-up: We offer counseling and create personalized plans for students who require assistance in improving their academic performance.

2. Attention to Diversity: We make non-significant curricular adjustments, particularly concerning methodologies and evaluation, to accommodate students with specific educational support needs. This approach aims to ensure equal opportunities for all students.

3. Extracurricular Training Resources: Students can access various extracurricular training resources designed to enhance their personal and professional development.

4. Vocational Guidance: We provide tools and guidance to students who are uncertain about their career choices or believe they may have made a mistake in selecting their degree.

Students in need of educational support can reach out to us at: orientacioneducativa@universidadeuropea.es.

11. ONLINE SURVEYS

Your opinion matters! The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process. The surveys will be made available in the “surveys” section in virtual campus or via e-mail. Your assessment is necessary for us to improve. Thank you very much for your participation.