



UCAM
UNIVERSIDAD
CATÓLICA DE MURCIA

2018/2019 Course Guide

Data Analysis

Bachelor's in Physical Activity and Sports Science

Mode: On Campus

Index

Data Analysis	¡Error! Marcador no definido.
Brief Description of the Course.....	¡Error! Marcador no definido.
Prerequisites.....	3
Objectives	3
Competencies and Learning Outcomes	4
Methodology	5
Syllabus.....	5
Relationship to Other Courses in the Study Plan	7
Assessment System.....	7
Bibliography and Reference	9
Related Websites	9
Teaching Materials	10
Tutorials	10

Data Analysis

Module: **Applied Sciences and Motor Skills.**

Subject: **Sciences Applied to Physical Activity and Sports.**

Level: **Mandatory.**

No. of Credits: **6 ECTS.**

Academic Session: **Second Course – Quarterly.**

Course Professors: **Daniel López-Plaza Palomo and Pedro E. Alcaraz**

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Office Hours: **Tuesdays 11:00 – 12:00 and Thursdays 17:30 – 18:30 (Building 1, Cátedra de Medicina del Deporte).** Students must send an email to agree and appointment with the professors in advance.

Professor coordinating the Module, Subject, or Course: **Daniel López-Plaza Palomo**

Brief Description

The Data Analysis subject focuses on the development of tools related to the management and treatment of data sets from specific areas of Sports Sciences: management, education, health, and performance. The processes of data acquisition and the most appropriate way to treat them will be mastered with the purpose of extracting useful information to allow students to make decisions. Students should acquire the necessary skills to develop themselves for their future work environment with the appropriate skills and quality developed from the degree.

Prerequisites

There are no prerequisites for the course.

Objectives

1. To possess and understand knowledge in an area of study that, based on general secondary education, reaches a level which incorporates knowledge from the forefront of the field of Physical Activity and Sports Sciences.
2. To apply acquired knowledge to their work in a professional manner and to possess the necessary skills for the preparation and defense of arguments and problem-solving within the area of Physical Activity and Sports Sciences.
3. To collect and interpret relevant data in the area of Physical Activity and Sports Sciences that allow to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.
4. To transmit information, ideas, problems and solutions to a specialized and non-specialized people.
5. To possess the necessary learning skills to undertake later studies with a high degree of autonomy.

Course

6. To promote a holistic education that allows for the complete development of the person and their future professional excellence, taking into account the basic elements of European and Western culture: Theology, Ethics, and Humanities.

Competencies and Learning Outcomes

Interdisciplinary Competencies

- (CT1) Analysis and synthesis.
- (CT2) Organization and planning.
- (CT3) Oral and written communication in the native language.
- (CT5) Computer skills related to their field of study.
- (CT6) Ability for information management.
- (CT7) Problem-solving.
- (CT8) Decision-making.
- (CT9) Teamwork.
- (CT11) Intrapersonal relationships.
- (CT13) Critical reasoning.
- (CT14) Ethical commitment.
- (CT15) Autonomous learning.
- (CT16) Adaptation to new situations.
- (CT17) Leadership.
- (CT18) Creativity.
- (CT20) Entrepreneurial initiative and spirit.
- (CT21) Motivation for quality.

Specific Competencies

- (CSE8) To apply the basic statistical tools in the field of Physical Activity and Sports Science.

UCAM Competencies

- (CUCAMT1) To express oneself correctly in Spanish in their disciplinary field.
- (CUCAMT 3) To project knowledge, abilities, and skills acquired to promote a society based on the values of freedom, justice, equality, and pluralism.
- (CUCAMT 5) To use basic ICT tools as a user.
- (CUCAMT 6) To work as a team, interacting with other people from the same or different professional field.
- (CUCAMT 7) To develop skills in initiating research.

Learning Outcomes

- (RA) To understand and distinguish the characteristics of different data analysis tools.

Course

- (RA) To interpret the basic statistical analyses of the specific scientific literature about physical activity and sport.
- (RA) To determine and use the most appropriate statistical tools for data analysis from research studies in physical activity and sport for the performance of their training and professional activities.
- (RA) To understand, reason, and synthesize content from various fields of knowledge.
- (RA) To manage and organize information acquired during the learning process.
- (RA) To correctly express oneself orally and in writing in their native language.
- (RA) To know and use the possibilities that information technology, in its different applications, offers to its field of study.
- (RA) To organize and know how to use information from different contexts.
- (RA) To decide between different options in a comprehensive and critical way.
- (RA) To acquire and implement collaboration strategies and skills that promote cooperative work.
- (RA) To develop their own professional work in a globalized environment.
- (RA) To acquire and implement social and communication skills that favor interaction.
- (RA) To proactively manage their learning process.
- (RA) To adjust their behavior to the changes and demands that arise in new situations.
- (RA) To plan and develop innovative actions both in their field of knowledge and in everyday life.
- (RA) To correctly use the orthographic and grammatical norms in oral and written language.
- (RA) To know and properly use the resources that make it possible for new information and communication technologies.
- (RA) To undertake actions that promote interest and motivation for research.

Methodology

Methodology	Hours	Hours of Classroom Work	Hours of Non-Classroom Work
Theory Lecture	33	60 hours (40 %)	
Tutorials	3		
Seminars	9		
Practicums	12		
Autonomous Work	45		90 hours (60 %)
Applied Work	45		
TOTAL	150	60	90

Syllabus

Theory Program

Topic 1. Introduction.

Course

- 1.1. Definition: data and data analysis.
- 1.2. Types of studies.
- 1.3. The basic process of data analysis in the field of Sport Sciences.

Topic 2. Define: design prior to analysis.

- 2.1. Study Objective.
 - 2.1.1. Proposal of a question/problem to solve.
 - 2.1.2. Review evidence on the subject.
 - 2.1.3. Define the objective.
- 2.2. Sample selection.
 - 2.2.1. Define the study population.
 - 2.2.2. Specify the selection criteria.
 - 2.2.3. Estimate the sample size.

Topic 3. Divide: Prepare the data.

- 3.1 Data collection.
 - 3.1.1. Selecting the variables.
 - 3.1.2. Defining the variables.
 - 3.1.3. Character of the variables.
 - 3.1.4. Type of variables.
- 3.2. Prepare the data.

Topic 4. Evaluate: analyze the data.

- 4.1 Descriptive Analysis.
 - 4.1.1 Statistics for qualitative variables: frequency distribution.
 - 4.1.2 Statistics for quantitative variables: centralization, dispersion, and form.
- 4.2 Inferential Analysis.
 - 4.2.1 Introduction to the calculation of probabilities.
 - 4.2.2 Factors of interaction and of confusion.

Topic 5. Decide: Draw conclusions.

- 5.1 Generating conclusive reports.
- 5.2 Other compatible programs.

Practice Program

Practicum 1 (T2_p1). Determine the study objective and select the sample.

Practicum 2 (T3_p1). Data collection and preparation: web search, types of pasting, defining variables, cell formatting: source, sort and filter.

Practicum 3 (T3_p2). Data collection and preparation: web search, types of pasting, defining variables, cell formatting: alignment and cells, conditional formatting.

Course

Practicum 4 (T3_p3). Data collection and preparation: defining variables, text in columns, search data, codification of variables, counting function.

Practicum 5 (T3_p4). Data collection and preparation: formulation and \$.

Practicum 6 (T4_p1). Descriptive analysis for the entire sample. Qualitative variables. Tables and graphs.

Practicum 7 (T4_p2). Descriptive analysis for the entire sample. Qualitative and quantitative variables (centralization statistics). Tables and graphs.

Practicum 8 (T4_p3). Descriptive analysis for a stratified sample. Qualitative and quantitative variables (centralization statistics). Tables and graphs.

Practicum 9 (T4_p4). Descriptive analysis for a stratified sample. Qualitative and quantitative variables (centralization statistics). Dynamic tables and graphs.

Practicum 10 (T4_p5). Descriptive analysis. Measurement of dispersion and form. Tables and graphs.

Practicum 11 (T4_p6). Introduction to the calculation of probabilities.

Practicum 12 (T4_p7). Factors of interaction and of confusion.

Practicum 13 (T5_p1). Reports (I).

Practicum 14 (T5_p2). Reports (II).

Relationship to Other Courses in the Study Plan

Foundational Concepts of Sport Sciences.

Research Methodology for Physical Activity and Sport.

Recording techniques, tests, and instruments.

New Technologies in Physical Activity and Sport.

Assessment System

Continuous assessment modality: Students enrolled in this evaluation system and who exceed 60% of the class attendance.

February/June Session:

For the February/June/September Sessions:

- Theory Part: [80% of the total grade]

The theory part of the subject will be evaluated in one theory-practice partial exam and one final exam. These will be passed as long as the grade of each is equal to or greater than 5. Grades no less than 4 will be considered when the final weighed grade is greater than 5, taking into account the grades of the practice part. The value of each of the exams will be: the first partial exam 50%, and the final exam 50%. Student who do not pass the partial exam will take a final exam that will have a value of 100%.

Course

There will be two exam sessions, one unofficial one to take the partial exam, and another official session to take the final exam. If students pass the first partial, only the second half of the material will be tested in the official session. If students fail the first partial, they will be tested on this first half together with the second half during the official session. This exam will be held through two different exams.

- Practice Part: [20% of the total grade]

The practice part of the subject consists of two didactic elements: a group project and workshops. In the group project, the students, in groups of 3-4 persons, will have to demonstrate that they have mastered the contents taught in class, analyzing a complete set of data carried out from the beginning to the end of the course. This will be mandatory. It will be necessary to pass this part with a score of 5 for an average grade with the rest of the parts. This will be worth 20% of the total.

On the other hand, the workshops will consist of practical exercises related to the subject matter, which will be done individually and may be proposed both during class time and as homework. It will be necessary to turn these in at the date and time indicated by the professor for evaluation. The set of workshops carried out are worth 20% of the total grade of the subject. This grade is cumulative with the rest of the parts. It is not necessary to pass them with a grade of 5 for the average grade.

* In the event that the group work or either of the two exams are failed in the January/June session, the student will retake only the part failed in September. The grades of the passed parts will be saved.

The student shall pass the subject when the average is equal to or greater than 5 points and all the parts of the assessment system have been passed, whose overall value is equal to or greater than 20%. If the student has less than 5 in any of the parts whose value is equal to or greater than 20%, the subject will be suspended, and the student must retake the part(s) in the next session within the same academic year. The suspended part(s) in official sessions (February/June) will be saved for successive sessions that are held in the same academic year. In the case that the subject is not passed in the September session, the passed parts will not count for successive academic years.

The assessment system (RD 1.125/2003. of September 5) shall be the following:

0-4.9 Suspended (SS)

5.0-6.9 Passed (AP)

7.0-8.9 Excellent (NT)

9.0-10 Outstanding (SB)

Honorable mention may be granted to students who have earned a grade equal to or greater than 9.0. This number may not exceed 5% of the total number of students enrolled in a subject in the corresponding academic year, unless the number of students enrolled is less than 20, in which case only a single honorable mention may be granted.

September Session

Students must pass the part that they failed in the previous evaluations.

If it is one or both of the exams, they must show up for the corresponding practice-practice exam.

If it is the project, it must be presented again.

If they have not done any workshop or they want to increase the grade of this part, they can present the workshops they are missing.

To pass the subject, at least half of the score of each of the parts must be obtained.

Basic Bibliography

- Dretzke, B. (2008). *Statistics with microsoft excel*. Prentice Hall Press.
- Banfield C (2011). *Excel 2010 for Dummies*. Madrid. CEAC. (Topic 2, 3 and 4)
- Field A. (2009). *Discovering statistics using SPSS*. Sage Publications.
- Levine, D. M., Berenson, M. L., Stephan, D., & Lysell, D. (1999). *Statistics for managers using Microsoft Excel* (Vol. 660). Upper Saddle River, NJ: Prentice Hall

Additional Bibliography

- Heiberger, R. M., & Neuwirth, E. (2009). *R through Excel: A spreadsheet interface for statistics, data analysis, and graphics*. New York: Springer.

Related Websites

<https://spreadsheeto.com/how-to-use-excel/>

<https://www.prophetcrm.com/how-to-use-excel/>

Keep in mind the instructions given by the professor at the beginning of the course. The professor will confirm with the students the time frame of the contents, the bibliography and work material, the methodologies to be followed, and other guidelines of interest that will have an impact on the learning of the subject. Attend classes and participate in them actively. Orient efforts and studies to the understanding of the contents of the subject. Consult the recommended bibliography in each topic and do not limit yourself to the study of the notes taken in class. Use the established schedule, the Virtual Campus, or the e-mail for consultation and to ask questions to the professor.

Teaching Materials

Each student will need a computer and the professor will require internet connection and a projector for each session. Therefore, it would be ideal to have APIs to teach the subject. The Excel and SPSS programs will be needed and should be updated and available for their use, without restricted

Course

access. Internet data sources will be used, either in article format or web page. The oral presentations will serve as conceptual support to the practical contents of the subject.

Tutorials

Brief Description

To guide and advise the student in the teaching-learning process and to contribute to the consolidation of knowledge, abilities, skills, capacities, attitudes related to the interdisciplinary or general competencies such as group work, oral and written communication, values and professional deontology and autonomous student learning. The tutoring schedule will be established by the professor during each quarter.