UCAM
UNIVERSIDAD
CATÓLICA DE MURCIA

Guía Docente 2018/2019

Applied Statistical Techniques in Strength and Conditioning

Técnicas Estadísticas Aplicadas al Rendimiento Deportivo y el Acondicionamiento Físico

Master's in High Performance Sport: Strength and Conditioning

Mode: Semi-presencial

Table of Contents

Applied Statistical Techniques in Strength and Conditioning

Module: **II**.

Subject matter: **Applied Statistical Techniques in Strength and Conditioning.**

Requisite: **Mandatory.**

Nº of credits: **3.5.**

Academic term: **2nd semester**

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Office hours: **by appointment via email**

Coordinator: **Dr. David Prieto Merino**

Brief Description

An introduction to statistical concepts.

Upon completion of this course, the student will be able to: compare descriptive statistics, construct and analyze statistical graphs using computer software, calculate probabilities using laws of probability and discrete and continuous probability distributions, estimate parameters with confidence intervals, perform hypothesis tests, create and apply regression models based on experimental data and evaluate published statistical results.

Breve descripción del módulo

Materia de Estadísticas es una introducción a los conceptos estadísticos.

Al finalizar el curso, el alumno será capaz de: comparar la estadística descriptiva, construir y analizar gráficos estadísticos utilizando software, calcular las probabilidades con las leyes de probabilidad y distribuciones de probabilidad discretas y continuas, los parámetros de estimación con intervalos de confianza, realizar las pruebas de hipótesis, crear y aplicar modelos de regresión basados en datos experimentales y evaluar los resultados estadísticos publicados.

Pre-requisites

None.

Objectives

1. Analyze and utilize research methods, techniques and resources in different áreas of reference.

2. Gather and interpret relevant data in the areas of sports performance for understanding the scientific nature.

Competencies and Learning Outcomes

MECES1: Students will know how to apply the acquired knowledge and have the capacity to problem solve in new or unfamiliar settings within broader (or multidisciplinary) contexts related to their field of study.

MECES2: Students will be able to integrate knowledge and handle the complexity of formulating judgment based on information that may be incomplete or limited, including reflections on social and ethical responsibilities linked to the application of their knowledge and judgment.

MECES3: Students will know how to communicate their conclusions (and the knowledge and rationale underpinning them) to the public (specialists and non-specialists) in a clear and unambiguous manner.

MECES4: Students will possess learning skills that will allow them to continue studying in a way that is largely self-directed or autonomous.

MECES5: To have and understand knowledge that will provide them the foundation or opportunity to be original in the development and/or application of ideas, often within the research context.

G1: To acquire skills through the teaching-learning process that allows them to continue learning in the field of sports training and conditioning not only with established contacts with Master's Degree professors and professionals but also autonomously.

G2: To acquire and to consolidate the initiative, the entrepreneurial spirit to start up projects related to sports training and conditioning.

T1: Capacity for analysis and synthesis.

T2: Capacity for organization and planning.

T3: Computing knowledge related to the field of study.

T4: Decision making

T5: Teamwork

T7: Skill in interpersonal relationships

T8: Critical thinking

T9: Ethical commitment.

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T10: Study autonomously.

T11: Adapting to new situations.

T12: Creativity.

T14: Motivation for quality.

T15: Capacity for reflection

T16: Problem solving

U1: Consider the principles of Christian humanism as core values in the development of professional practice.

U2: Being able to project the acquired knowledge and skills to promote a society based on the values of freedom, justice, equality and pluralism.

S4: Identify different research approaches and paradigms Sports Performance and Conditioning.

E1: Apply statistical techniques necessary to conduct a proper analysis of data in each of the research methodologies in the area of Performance and Conditioning.

C6: Critically evaluate, from the perspective of data analysis, the procedures, results and conclusions that are presented in any scientific report.

Methodology

Methodology	Hours	Work hours Required attendance	Work hours no attendance
Theoretical exposition	8.75	17.5 hours (20 %)	
Discussion groups, seminars	3.5		
Evaluation	1.75		
Tutorial	3.5		
Personal study	35		70 hours (80 %)
Preparation of work and exposition	21		
Analysis of scientific articles	7		
Literature search	7		
TOTAL	87.5	17.5	70

Syllabus

Theoretical Teaching Program

Topic 1. Introduction to applied statistics in Sports Sciences.

Topic 2. Introduction to SPSS.

Topic 3. Measures of central tendency, position and dispersion measures.

Topic 4. Classification and distribution of the sample.

Topic 5. The statistical power and effect size.

Topic 6. Sample size calculation.

Topic 7. Difference between groups.

Topic 8. Association between variables.

Practical teaching program

Seminar 1. Familiarization with SPSS.

Seminar 2. Descriptive statistical analysis.

Seminar 3. Study of sample normality.

Seminar 4. Inferential Statistics I (relationship between groups).

Seminar 5. Inferential Statistics II (comparison between groups).

Relationship with other subjects of the curriculum

This material is related to: Research Methodology, Practicum and Master's Thesis.

Evaluation System

February/June/September Call:

The evaluation system of the acquisition of learning outcomes of each of the modules' compulsory subjects will be based, in general, with the following grade distribution:

- 20% for written tests, in which evaluate the topic contents presented through theoretical-practical presentation, reading and analysis of documents provided in the module.
- 20% for assessment on workshops, presentations and classroom discussions.
- 60% for assessment of dynamic course work developed in seminars and workshops

The weighting range established in the evaluation system is 5%, and it will be determined based on the type of evaluations given in the module.

The module will have 2 calls for turning in assigned work: a regular call (set at the end of the module) and an extraordinary call (set prior to the first call the final Master's Thesis work).

The scoring system will be as follows, set by R.D. 1.125/2003 of September 5th: Fail: 0-4,9; Pass: 5-6,9; Notable: 7-8,9; Outstanding: 9-10. The honorable mention of Distinction (Matrícula de honor) will be awarded by the professor to the student. Based on the number of students enrolled, only 5%

will be eligible for this honorable mention, except for when the enrollment is under 20 in which case only one student will be granted this honor.

The honorable mention of Distinction (Matrícula de honor) will be awarded by the professor to the student. Based on the number of students enrolled, only 5% will be eligible for this honorable mention, except for when the enrollment is under 20 in which case only one student will be granted this honor.

To have a passing grade for this module, one must obtain at least half of the total score for each of the instruments of evaluation.

Bibliography

Basic Bibliography

- Pardo A. y Ruiz M.A. (2005). Análisis de Datos con SPSS 13. Madrid: McGrawHill.
- Pardo A. y San Martín, R. (2009a). Gestión de datos con spss statistics. Madrid: Síntesis.
- Pardo A. y San Martín, R. (2009b). Análisis de Datos en Ciencias Sociales y de la Salud I. Madrid: Síntesis.
- Pardo A.; Ruiz, M.A. y San Martín, R. (2012). Análisis de Datos en Ciencias Sociales y de la Salud II. Madrid: Síntesis.
- Álvarez, R. (1995). Estadística multivariante y no paramétrica con SPSS; aplicación a ciencias de la salud. Madrid: Díaz de Santos.
- Gondar, J.E (2003). Estadística aplicada al deporte y educación física. Madrid: Ed. Data Mining Institute,
- Thomas, J.R. y Nelson, J.K. (2006). Métodos de Investigación en Actividad Física. Badalona: Paidotribo.

Complementary bibliography

- Balluerka, N. (2002). Diseños de investigación experimental en psicología: modelos y anáisis de datos mediante el SPSS 10.0. Madrid: Prentice Hall.
- Levy J.P. y Varela, J. (2005). *Análisis multivariable para las Ciencias Sociales.* Madrid: PrenticeHall.

  Rial, A. y Varela J. (2008). Estadística práctica para la investigación en ciencias de la salud. La Coruña: Netbiblio.

Related websites

Aula Virtual se Bioestadística

http://e-stadistica.bio.ucm.es/web_spss/indice_spss.html

Tutorial de SPSS por Michael Speed, Texas A&M University
http://www.uccs.edu/~faculty/lbecker/SPSS/content.htm

Guía SPSS Harvad-MIT Data Center
http://www.hmdc.harvard.edu/projects/SPSS_Tutorial/spsstut.shtml

Universidad de UCLA
http://www.ats.ucla.edu/stat/spss/default.htm

Página oficial SPSS
http://www.spss.com/es

Página Revista CCD
http://ccd.ucam.edu/index.php/revista/index

Study tips

- Attend all classes and participate actively in the classroom.
- Orient the effort and study to understand course contents.
- Use office hours, Campus Virtual and or consult via email with the professor(s) to resolve questions.

Educational materials

Educational materials used in the course to facilitate the acquisition of skills are:

- PowerPoint presentations that professors' use will serve as an outline or guide of the content presented in class (and not as detailed notes on the subject). Students will make their own notes using all the educational materials described herein.
- Scientific articles, shared through Campus Virtual, will be related to specific content taught in class. Forum and social networks (Twitter) will be used to raise questions that would require some critical thought and to provide practical application for each article.
- Supporting documents will be shared also through Campus Virtual or will be sought by students through information technology and communication. These documents should also be related to specific content presented in class.
- Conceptual maps and discussion reports for each one of the content topics.

- Utilize SPSS software (statistical package for the social sciences) that is specific to management and analysis of data.