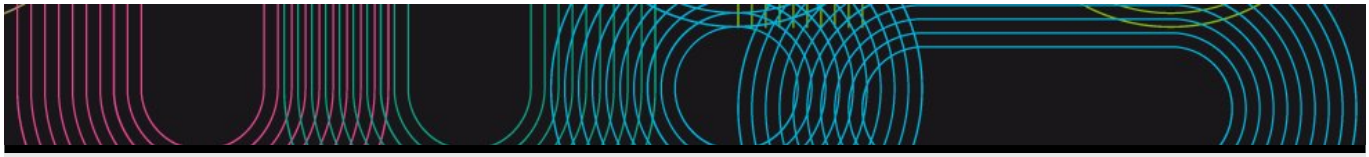

IDENTIFYING DATA

Statistics: Research methodology and statistics in physical activity and sport

Subject	Statistics: Research methodology and statistics in physical activity and sport			
Code	P02G050V01302			
Study programme	Grado en Ciencias de la Actividad Física y del Deporte			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	2nd	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Iglesias Pérez, María Carmen			
Lecturers	Iglesias Pérez, María Carmen			
E-mail	mcigles@uvigo.es			
Web				
General description				

Training and Learning Results

Code	
B2	Knowledge and comprehension of the scientific literature of the area of the physical activity and the sport.
B11	Knowledge and comprehension of the ethical beginning necessary for the correct professional exercise.
B12	Application of the technologies of the information and communication (TIC) to the area of the Sciences of the Physical Activity and of the Sport.
B13	Habits of excellence and quality in the professional exercise.
B25	Skill of leadership, capacity of interpersonal relation and teamwork.
B26	Adjustment to new situations, the resolution of problems and the autonomous learning.

Expected results from this subject

Expected results from this subject	Training and Learning Results
To understand the scientific literature in the field of Physical Activity and Sports Sciences, focusing on the statistical methods used in research studies.	B2
To know how to apply information and communication technologies (ICT) tools to the field of Physical Activity and Sport Sciences and, specifically, to use statistical software and Internet resources.	B12
To develop the ability of work in teams, focusing on the values of effort and respect for others, without taking advantage of others work.	B25
To develop skills for the adaptation to new situations, the resolution of problems and the self-learning.	B26
To promote principles of professional excellence and quality.	B13
To know the statistical ethical principles, regarding to seek permission to collect data sets, to kept the statistical secret and not to manipulate the report.	B11
To know the characteristics of the scientific thought: to question the intuitive ideas, to get data, to do a critical analysis of the observations, to argue and to take of decisions from rational criteria and critical thinking.	B2 B13 B26

Contents

Topic	
Part 1. Introduction to the research methodology in Physical Activity and Sport Sciences.	1.1 The scientific method of resolution of problems. 1.2 Parts of a paper and a tesis. 1.3 Types of research: analytical, descriptive, experimental, qualitative. 1.4 Reliability and validity.
Part 2. Data analysis and applied statistics.	Lesson 2: An introduction to Statistics. One dimensional descriptive statistics. 2.1 Statistics and scientific research. 2.2 Basic concepts: population, sample, variables. 2.3 Tabulated and graphical description. 2.4 Measures of central tendency, spread, skewness, and kurtosis. Lesson 3. Two dimensional descriptive statistics. 3.1 Qualitative data analysis: contingency tables, graphical description and dependency measures. 3.2 Box-plot diagram of a variable recorded by groups. Comparison of mean and variance. 3.3 Covariance and linear correlation. 3.4 Simple linear regression model. Lesson 4. Introduction to Statistical Inference and Probability models. 4.1. Introduction to Statistical Inference. 4.2. Probability: basic concepts. 4.3. Random variable. 4.4. The Normal distribution. Applications. 4.5. Point estimation. The sample mean. 4.6. Calculation of the sample size. 4.7. Confidence intervals for mean and proportion Lesson 5. Testing of Hypothesis. 5.1 Definition and classical methodology of testing: types of hypothesis, associated errors, significance level, critical region. 5.2 p-value. 5.3 Two sample t-test 5.4 chi-squared test of independence. 5.5 Shapiro-Wilks test for normality. 5.6 Pearson correlation test.
Part 3. Introduction to informatics applied to statistics.	Lesson 6: Analysis of real data with Calc and R Commander. 6.1 One-dimensional descriptive analysis. 6.2 Two-dimensional descriptive analysis. 6.3 Hypothesis Testing and Confidence Intervals.

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	11.25	11.25	22.5
Problem solving	11.25	11.25	22.5
Mentored work	1	24	25
Practices through ICT	26	13	39
Problem and/or exercise solving	2	15	17
Laboratory practice	4	20	24
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
	Description
Lecturing	Professor explanation on theoretical concepts, that will have to study out of class. At the beginning of each lesson, students will be provided with material for a better comprehension of the class.
Problem solving	Resolution of exercises and activities proposed by the professor in a bulletin associated with each topic to reinforce the concepts of the master class.
Mentored work	The students will make a work of analysis of data focused in the application and interpretation of the statistical concepts and models of the matter. The work will be carried out as a team work.

Practices through ICT	Statistical software will be used for the analysis of data, mainly EXCEL, CALC and R Commander. With regard to Lesson 1, the practices will be focused on the analysis of research papers: type, schedule, hypothesis, methodologies, results and conclusions.

Personalized assistance

Methodologies	Description
Mentored work	Any questions will be resolved in the usual tutorials. Tutoring can be telematic by appointment.
Tests	**Description**
Laboratory practice	Any questions will be resolved in the usual tutorials. Tutoring can be telematic by appointment.
Problem and/or exercise solving	Any questions will be resolved in the usual tutorials. Tutoring can be telematic by appointment.

Assessment

	Description	Qualification	Training and Learning Results
Mentored work	Evaluation of the team work. Each activity of group will have a grade, that will move to the components of the group according to his/her contribution. The final grade is the average (or weighted average) of all the activities.	20	B2 B11 B12 B13 B25 B26
Problem and/or exercise solving	Test with short questions and problems about concepts, models and exercises exposed and discussed in theoretical sessions.	40	B13 B26
Laboratory practice	Two test (20%- 20%) about resolution/ interpretation of practical problems of statistical data analysis with software.	40	B2 B12 B13 B26

Other comments on the Evaluation

First call:

The students can choose between a system of continuous assessment or a global assessment.
Continuous assessment is recommended.

1- Continuous assessment has the following activities:

One test about concepts and problems studied in theoretical classes, two test with the computer and a group work.

In the 3 test a minimum grade of 4 (over 10) will be necessary to calculate the final average.

If a student does not work systematically in group activities, he or she may be expelled from the group, according to a protocol established at the beginning of the course.

2- The global ssessment has the following activities:
One test of theoretical concepts and problems (50%) and one test with the computer (50%).
In the 2 test a minimum grade of 5 (over 10) will be necessary to calculate the final average.

Second call:

1- Continuous assessment:

In the second call, the same exam structure will be repeated as during the course, so that each student may retrieve the part that corresponds to him/her.
The grade of the group work keeps.

2- Global assessment:

In the second call, there are one test of theoretical concepts and problems (50%) and one test with the computer (50%).
In the 2 test a minimum grade of 5 (over 10) will be necessary to calculate the final average.

From one course to another, passed partial exams or parts of the subject will not be kept.

Sources of information

Basic Bibliography

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Complementary Bibliography

Ortega,E. et al., **Manual de estadística aplicada a las ciencias de la actividad física y el deporte**, Murcia: DM, 2009

Sánchez Zuriaga, D, **Estadística aplicada a la fisioterapia, las ciencias del deporte y la biomecánica**, Madrid: CEU, D. L., 2011

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Recommendations