

STATISTICS APPLIED TO PSYCHOLOGY I – Code 800146

Academic Year 2016-17

COURSE INFORMATION

Undergraduate Studies: 0812 – Bachelor's degree in Psychology (Studies Plan 2009-10)

Type: Basic (compulsory)

ECTS: 6.0

Module: Basic training

Area: Statistics

Year: First

Semester: 1

LECTURER INFORMATION

Name: Dr. Rocío Alcalá Quintana

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Office number: Main Building, First floor

Office hours (Fall semester): Mondays, 15.30 - 18.00. Wednesdays, 15.30 - 18.00

SYNOPSIS

COMPETENCIES

General competencies

GC6: Know and understand research methods and data analysis techniques.

Transversal competencies

TC1: Analysis and synthesis.

TC2: Preparation and defence of properly reasoned arguments.

TC3: Problem solving and decision making in Psychology.

TC5: Looking for information and data interpretation on social, scientific and ethical topics related to the field of Psychology.

TC6: Team work and collaboration with other professionals

TC7: Critical thinking and self-analysis.

TC8: Learning how to learn, skills for life-long learning.

Specific competencies

SC17: Be able to measure and obtain relevant data for the evaluation of interventions.

SC18: Know how to analyse and interpret results of evaluations.

SC19: Know how to appropriately and accurately provide feedback to recipients.

TEACHING ACTIVITIES

TEACHING ACTIVITIES	Hours	% of total credits	Attendance
Theory classes	45	30 %	100%
Practical sessions	15	10 %	100%
Students' work	82.5	55 %	0%
Assessment	7.5	5 %	100%

BRIEF DESCRIPTION:

Basic concepts of measurement and types of variables. Introduction to Statistics. Data summarization and visualization. Measures of central tendency, variability, and skewness. Measures of association. Introduction to probability theory. Probability distributions of some continuous and discrete random variables. Sampling.

PRE-REQUISITES

Basic proficiency in secondary school maths is required to follow the course adequately.

OBJECTIVES

This course aims at providing the students with the necessary background to study the most widely used quantitative data analysis techniques in the various areas of Psychology. This background focus on descriptive statistics and on the basics of probability theory required to prepare students for the subsequent course on statistical inference.

TOPICS

Part I: Descriptive statistics

1. Introduction
2. Summarizing data: Frequency distributions and graphical representations
3. Measures of location and central tendency
4. Measures of variability
5. Measures of shape: skewness and kurtosis
6. Standard scores
7. Bivariate frequency distributions
8. Measures of association and linear correlation

Part II: Probability

9. Introduction to Probability Theory
10. Random variables
11. Probability distributions of discrete random variables
12. Probability distributions of continuous random variables

ASSESSMENT

Grading will be based on three components:

– **Final exam** (70% of the final mark). The final exam will take place at the end of the semester. It will be based on all material covered during the course and it will consist of exercises and problems similar to those in your assignments, homework, and examples shown in class. The exam will be closed book, but students will be allowed to bring (i) a hand-written formulae sheet (up to 3 DIN-A4 pages, two sided), (ii) a non-programmable scientific calculator, and (iii) the set of statistical tables available on Virtual Campus.

At least 40% of the maximum score in the exam is required to pass this course. Students who fail Statistics-I in February will have the opportunity to take a re-exam in September.

– **Assignments** (20% of the final mark). Assignments will be posted on Virtual Campus along the semester and submission deadlines will be agreed upon with the class. All assignments must be submitted to be able to pass the course. However, only assignments submitted on time will be graded. Late submissions will receive 0 points, which will contribute to the final mark. No passing mark is required on this component.

Students who miss any assignment and fail in February will be allowed to submit missing assignments in September to meet the requirement to pass, but these will be considered late submissions in all respects.

– **In-class activities** (10% of the final mark). Class attendance is recommended but not mandatory. Students who attend classes are expected to prepare for them (including homework) and to participate actively.

Only those who meet these requirements will earn credit for this component. No passing mark is required here and students who fail in February will keep the mark earned during the semester for September.

FINAL GRADES. Provided that you earned at least 40% of the maximum score in the exam, your final mark will be a weighted mean of the marks earned on the three components. Final grades will be assigned according to your final mark (ranging from 0 to 10) on the following scale:

[0, 5): Suspenso (SS) [7, 9): Notable (NT)

[5, 7): Aprobado (AP) [9, 10]: Sobresaliente (SB)

RESOURCES

Textbook

There is no required textbook for this course. One or two chapters from different textbooks will be recommended on Virtual Campus as "further reading" for each topic and a list of useful books for reference is provided in next section.

Lecture notes will be made available on Virtual Campus before the corresponding topic is covered in class. It is strongly recommended that you print those lecture notes and bring them to class.

Homework exercises and problems will also be regularly posted on Virtual Campus. Further exercises can be found in the books listed next.

Course website

The course website is accessible through Universidad Complutense's Virtual Campus, (<http://www.ucm.es/campusvirtual>). The website is an essential element of the course and relevant information (including lecture notes, assignments, exercises, supplemental materials, announcements, etc.) will be posted there on a regular basis. Students are responsible for checking it frequently for news and updates.

Basic references in English

The following books are either available in the library or freely downloadable from the Internet.

- Freund, J. E. (2007). *Modern Elementary Statistics*, 12th Edition. Englewood Cliffs, NJ: Prentice-Hall.
- Gravetter, F.J. & Wallnau, L.B. (2010). *Statistics for the Behavioral Sciences*, 8th Edition. Belmont, CA: Thomson-Wadsworth (L includes detailed explanations for students with poor mathematical background).
- Howell, D. C. (2016). *Fundamental Statistics for the Behavioral Sciences*, 9th Edition. Belmont, CA: Cengage Learning.
- Kroese, D.P. (2009). *A short Introduction to Probability*. University of Queensland. Available at <http://www.maths.uq.edu.au/~kroese/asitp.pdf>
- Minium, E. W. & Clarke, R. B., (1982). *Elements of Statistical Reasoning*. Hoboken, NJ: J Wiley & Sons.
- Spiegel, M.R., Schiller, J., & Srinivasan, R.A. (2008). *Schaum's Outline of Probability and Statistics*, 3rd. Edition. McGraw-Hill (L good source of probability exercises and problems).
- Vokey, J.R. & Allen, S.W. (2013). *Thinking with data*, 7th Edition. Lethbridge, Alberta: PspenceTM Publishing Society. Available at <http://people.uleth.ca/~vokey/pdf/thinking.pdf>
- Witte, R.S. & Witte, J.S. (2009). *Statistics*. Hoboken, NJ: John Wiley & Sons.

Basic references in Spanish (also available in the library)

- Amón, J. (1996). *Estadística para Psicólogos 1. Estadística Descriptiva*. Madrid: Pirámide.
- Amón, J. (1996). *Estadística para Psicólogos 2. Probabilidad y Estadística Inferencial*. Madrid: Pirámide.

Further references (most of them, but not all, available in the library)

- Botella, J., León, O.G. y San Martín, R (2001). *Análisis de datos en Psicología I. Teoría y ejercicios*. Madrid: Pirámide.
- Hays, W. L. (1988). *Statistics*. New York, NY: Holt, Rinehart & Winston.
- Moore, D. S. (2006). *The Basic Practice of Statistics*, 4th Edition. New York, NY: W.H. Freeman & Company.
- Peña, D. (1995). *Introducción a la Estadística para las Ciencias Sociales*. Madrid: McGraw-Hill Interamericana.
- Stephens, L.J. (2008). *Schaum's Outline of Statistics in Psychology*. McGraw-Hill.