

# COURSE SYLLABUS

## STATISTICAL MODELS IN PSYCHOLOGY

**Degree in Psychology  
C.U. Cardenal Cisneros  
University of Alcalá**

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**Academic year 2024/25**  
**2<sup>nd</sup> Year – 1<sup>st</sup> Term**

## COURSE SYLLABUS

Name of the subject:	Statistical models in Psychology
Code:	562011
Studies:	Degree in Psychology
Department and Area of Knowledge:	Department of Education and Psychology
Character:	Basic training
ECTS credits:	6
Year and Term:	2 <sup>nd</sup> Year, 1 <sup>st</sup> Term
Lecturer:	Douglas Jonathan Boegaerts de Faucigny de Lucinge de Windt Olaya García
Office hours:	It will be provided at the beginning of the Term Tuesday from 3:00 PM to 4:00 PM
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Language:	Spanish

### 1. INTRODUCTION

As a scientific discipline, the methodology used in psychology to generate knowledge applicable to large human groups, follows formal standards, both in obtaining, and analysing, evidence to draw conclusions. In this subject, the most common techniques of inferential statistics are presented with the intention that the student understands their theoretical basis, and learns how to apply the techniques and interpret the results.

#### Prerequisites and Recommendations

It is advisable to be familiar with Word, Excel and SPSS programs, as well as to review the contents of basic calculation. It is recommended to have passed the subjects Data Analysis in Psychology and Research Methods in Psychology taken in the first year.

#### SUBJECT DESCRIPTION

This subject is taken in the 1st term of the 2nd academic year of the Psychology Degree programme. It has a value of 6 ECTS credits.

As a scientific discipline, the methodology used to generate knowledge that is applicable to broad human groups in psychology adheres to formal standards both in data collection and in its analysis in order to draw conclusions. In this class, students will learn the most common analysis techniques used in inferential statistics, with the aim being that students learn to apply these techniques and interpret the results obtained with them understanding their theoretical basis.

The subject is taught in Spanish, but it's part of the English Friendly program for international students, so this syllabus, activities, tutorials and exams will be available in English for them.

## 2. COMPETENCES

### Generic competences:

GC1. To acquire the knowledge and understand the principles of Psychology as a scientific discipline, including theory, methods and application fields, with the support of advanced textbooks and documentation incorporating cutting-edge knowledge in this field of study.

GC2. To apply this knowledge in the professional field, by elaborating and defending arguments, and by identifying, articulating and solving problems in the field of Psychology. In other words, to be prepared to work as a general psychologist and not as a specialist.

GC3. To be able to collect and interpret relevant data on human behaviour, at both individual and social levels and in different contexts, to express reasoned opinions of social, scientific or ethical nature in the psychological field.

GC5. To have developed the necessary skills to continue training in an independent manner, in order to follow Master studies, with the purpose to acquire an advanced training focused on academic, professional or research specialisation in the field of Psychology.

### Specific competences:

SC6. To know and understand the different methods, and research designs, and data analysis techniques used in Psychology.

### 3. CONTENTS

Modules	Total hours
Statistical inference: parameter estimation, basic concepts and hypothesis testing.	• 12 h
Inference for one variable: testing one parametric value.	• 6 h
Inference for two categorical variables: testing for independence and interpretation of associations from residual analysis.	• 6 h
Comparison of means: T-test for independent and paired samples. Testing of assumptions and non-parametric tests.	• 6 h
Analysis of variance (ANOVA) y covariance (ANCOVA). Interpreting simple effects and interactions. A priori and a posteriori tests.	• 12 h
Regression and correlation analysis.	• 4 h
<b>TOTAL</b>	• 48 h

### 4. TEACHING-LEARNING METHODOLOGY. FORMATIVE ACTIVITIES.

#### Modalities:

The classes, corresponding to one third of ECTS credits, will be structured throughout the term in three different modalities: theoretical classes, practical classes and seminars.

- ✓ **Theoretical classes.** Different methodologies will be employed. Part of the theoretical contents will be provided and/or explained by the teacher, and others will be sought out and elaborated by the students. When requested by the teacher, students must attend class with the lesson prepared and the content will be commented on, debated or clarified in class. Some lessons will follow the cooperative learning methodology. Theoretical self-learning activities are included in this modality.
- ✓ **Practical classes.** These will be done individually or in groups and guided by the teacher. Such activities will include case-studies, problem solving, analysis and discussion of documentary and audio-visual information (articles, videos, scientific documents), as well as the presentation of academic and research work to the group. In addition, the guidelines for autonomous individual and group work will be provided in practical classes.

- ✓ **Seminars.** They consist of classes or didactic sessions where the teacher interacts with the students concerning group work in order to disseminate knowledge or develop research. Seminars also may take the form of specialized meetings for the in-depth study of a given topic. Learning is an active process, where the students must look for and prepare information in mutual collaboration with the teacher serving as a guide. In this subject, all students will attend and participate in monographic sessions supervised by the teacher.

Two thirds of the ECTS credits of the subject (102 hours) will be dedicated to **independent learning**. This includes the time needed to complete the tasks and activities that will be turned in or presented in class, to study and to prepare for exams. To pass, it is paramount that the student uses this time to achieve the desired learning outcomes.

The teacher will have office hours for personalised tutorials to supervise and guide the students in their training process.

#### 4.1. Credit distribution

Total number of hours (6 ECTS): 150	
Number of hours of classroom attendance 50:	30 hours of whole-group lessons
	15 hours of practical lessons
	3 hours of seminars
	2 hours of assessment tasks
Number of hours of independent learning 100:	100 hours

#### 4.2. Methodological strategies, materials and resources

##### Teaching-learning methodology:

In class, the student will be engaged in an active and participative methodology. To learn the contents, the student will have materials provided by the teacher with their corresponding explanation and analysis as a starting point. Activities will include the discussion of case-studies, research and experiences in socio-educational intervention. Problem-based learning will also be utilized where students have to find solutions to complex issues from an interdisciplinary perspective. This will be a coordinated effort amongst teachers from different disciplines.

## Materials and resources

Students will be provided with several complementary materials and resources to gain an understanding of different units and to do practical activities. These materials include documentation provided by the teacher, scientific articles, audio-visual materials, book chapters with theoretical and practical content, assessment instruments, scenarios and case-studies. The on-line platform of the university will give students fast and efficient access to the material. Other resources that will be used are digital whiteboards, projectors, multimedia classrooms and, where appropriate, computers and other computer resources.

## 5. ASSESSMENT: assessment criteria, report criteria and assessment procedures

### Assessment criteria:

The following are indicators of the learning outcomes that the student must achieve to pass the subject. Therefore, it is important that the student focuses on the fundamental aspects established for the assessment of the subject.

The assessment criteria are:

1. To know and understand the most common inferential statistic tests used in Psychology, along with their correct application.
2. To be able to answer a research question by, firstly, identifying the relevant evidence, then applying the appropriate analysis methods, and finally, interpreting the results.
3. To be able to produce reports where the capacity to plan and present the results of inferential statistics within the context of specific problems is manifested.

### Relationship between specific competences and assessment criteria

Competence	Assessment criteria
SC6. To know and understand the different methods, research designs and data analysis techniques used in Psychology.	<p>The student knows and understands the most common inferential statistic tests used in Psychology, along with their correct application.</p> <p>The student is able to answer a research question by identifying relevant evidence, applying the appropriate analysis methods and interpreting results.</p> <p>The student is able to produce reports where the capacity to plan and present the results of inferential statistics within the context of specific problems is manifested..</p>
GC1. To acquire the knowledge and understand the principles of Psychology as a scientific discipline, including theory, methods and application fields, with the support of advanced textbooks and documentation incorporating cutting-edge knowledge in this field of study.	<p>The student knows and understands the most common inferential statistic tests used in Psychology, along with their correct application.</p> <p>The student is able to answer a research question by identifying relevant evidence, applying the appropriate analysis methods and interpreting results.</p>
GC2. To apply this knowledge in the professional field, by elaborating and defending arguments, and by identifying, articulating and solving problems in the field of Psychology. In other words, to be prepared to work as a general psychologist and not as a specialist.	<p>The student is able to answer a research question by identifying relevant evidence, applying the appropriate analysis methods and interpreting results.</p>
GC3. To be able to collect and interpret relevant data on human behaviour, at both individual, and social levels, and in different contexts, to make judgements of social, scientific or ethical nature in the psychological field.	<p>The student is able to answer a research question by identifying relevant evidence, applying the appropriate analysis methods and interpreting results.</p> <p>The student is able to produce reports where the capacity to plan and present the results of inferential statistics within the context of specific problems is manifested.</p>
GC5. To have developed the necessary skills to continue training in an independent manner, in order to follow Master studies, with the purpose to acquire an advanced training focused on academic, professional or research specialisation in the field of Psychology.	<p>The student knows and understands the most common inferential statistic tests used in Psychology, along with their correct application.</p>

### Report criteria:

Assessment criteria	Percentage
The student knows and understands the most common inferential statistic tests used in Psychology, along with their correct application.	50 %
The student is able to answer a research question by identifying relevant evidence, applying the appropriate analysis methods and interpreting results.	35 %
The student is able to produce reports where the capacity to plan and present the results of inferential statistics within the context of specific problems is manifested.	15 %

### Assessment procedure

The assessment procedure is based on the ***Normativa reguladora de los procesos de evaluación de aprendizajes de la Universidad de Alcalá*** (Regulatory policy of the assessment procedure of the University of Alcalá). This policy states, among others, the following rules:

1. This subject has an ordinary assessment period in **May** and an extraordinary one in **June**.
2. The **ordinary assessment period** employs **continuous assessment**.
3. If a student cannot commit to the continuous assessment within the ordinary assessment, **he/she should formally request the final assessment** from the teacher of the subject. This request will be submitted no later than the second week of classes, and it can be accepted or rejected by university management.
4. The **extraordinary assessment period** is intended for students who did not take part in or who failed the ordinary one.
5. The characteristics of the continuous and final assessment for this subject are detailed in this course syllabus.
6. For more information about the assessment procedures, please see the following document: <https://www.uah.es/export/sites/uah/es/conoce-la-uah/organizacion-y-gobierno/.galleries/Galeria-Secretaria-General/Normativa-Evaluacion-Aprendizajes.pdf>

Requirements for **continuous assessment** in the ordinary assessment period:

- To attend practical classes and seminars.
- To complete and turn in the requested activities and work on time.
- To actively participate in the teaching-learning process.



If the student does not fulfil these requirements, he/she may not attend the exam and will be treated as if he/she did not take part in the ordinary assessment period. On his/her record, *no-show* will appear, and the student can attend the extraordinary period only after having previously talked with the teacher of the subject. If the student attends the extraordinary period, he/she may keep the marks of the continuous assessment obtained in the ordinary period.

To pass the subject, the student must achieve all of the aforementioned learning outcomes outlined in this course syllabus by means of the different instruments established to measure them. The student should complete all the assessment tests, an essential requirement for both the continuous, and final, assessments, either in the ordinary or extraordinary period.

#### Continuous assessment. Ordinary and extraordinary assessment periods:

Assessment criteria	Instruments			
	Seminars	Activities and works	Final exam	%
The student knows and understands the most common inferential statistic tests used in Psychology, along with their correct application.		X	X	50
The student is able to answer a research question by identifying relevant evidence, applying the appropriate analysis methods and interpreting results.		X	X	35
The student is able to produce reports where the capacity to plan and present the results of inferential statistics within the context of specific problems is manifested.	X	X		15
<b>Percentage</b>	<b>15</b>	<b>45</b>	<b>40</b>	<b>100</b>

**Final assessment. Ordinary and extraordinary assessment periods:**

Assessment criteria	Instruments			
	Seminars	Activities and works	Final exam	%
The student knows and understands the most common inferential statistic tests used in Psychology and their correct application.			X	50
The student is able to answer a research question by identifying relevant evidence, applying the appropriate analysis methods and interpreting results.			X	35
The student is able to produce reports where the capacity to plan and present the results of inferential statistics within the context of specific problems is manifested.		X	X	15
<b>Percentage</b>		<b>20</b>	<b>80</b>	<b>100</b>

## 6. BIBLIOGRAPHY

**Reference handbooks:**

- Pardo A., Ruiz, M. A., y San Martín, R. (2009) *Análisis de Datos en ciencias sociales y de la salud I*. Madrid: Síntesis.
- Pardo A. y San Martín, R. (2010) *Análisis de Datos en ciencias sociales y de la salud II*. Madrid: Síntesis.

These handbooks will be used for theoretical consultation. They explain the logic of descriptive analysis and inferential statistics and present the univariate and multivariate techniques most frequently used. Both the contents and presentations are conceived for the needs of professionals in social and health sciences, who do not intend to become experts in mathematical principles of statistical tools. For this reason, the texts focus on the usefulness of the available statistical methods and on how to select, apply and interpret them correctly, while at the same time, providing the necessary background to understand their logic and significance. These two texts review concepts of the subject *Data Analysis in Psychology*, including data analysis, types of variables, descriptive analysis, the Probability Theory, absolute deviations and probability density functions. Furthermore, they also review concepts of hypothesis testing and basics tools of inferential statistics taught in the present subject.

### Basic bibliography:

Amón, J. (2000) *Estadística para Psicólogos I y II*. Madrid: Pirámide

This two-volume textbook presents basic and useful concepts of statistics for social and health science professionals. Although it is not an updated edition, it is a classic reference used, for instance, in preparation for the exam to become a licensed clinical psychologist and for methodological training of doctoral students.

Ximénez C., Revuelta, J. (2011) *Cuaderno de prácticas de análisis de datos con SPSS*. Madrid: Universidad Autónoma de Madrid.

This is a workbook useful to review the application and interpretation of analysis techniques using SPSS with solutions to propose exercises.

Pardo, A. y San Martín, R. (1994). *Análisis de datos en Psicología II*. Madrid: Pirámide.

It includes the following topics: sampling, parameter estimation, hypothesis testing, comparison of means, analysis of variance (ANOVA) with one or several factors, regression and correlation, and non-parametric testing.