

Degree programme	Type	Course
Applied Statistics	OP	4

Contact lecturer

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Group languages

You can consult this information at the [end](#) of the document.

Prerequisites

This course uses the statistical software JAMOVl, and attending classes requires a laptop computer.

Objectives

"Statistical and psychometric models" is taught in the second semester of the second year, after having completed the two previous subjects on methodology, through which the students must have acquired the foundations of research methodology and data analysis.

On the basis of these previous subjects, in the current subject students will now move on to more complex statistical models, of a multivariable nature, introducing analytical solutions to three common phenomena in psychological research: interaction between variables; statistical control of confusing variables; and reduction in the dimensionality of data.

The training objectives of this subject are:

1. To learn the concept of a statistical model as an approach to the multidimensionality of research in psychology.
2. To understand the relationship between the research design used and the corresponding data analysis.
3. To know when and how to apply data-reduction techniques.

At the end of the course, students must be able to:

1. Specify the statistical model appropriate to the objectives and hypotheses of psychological research when research design allows this.
2. Distinguish between models that respond to a predictive hypothesis and those that respond to an explanatory hypothesis.
3. If necessary, include interaction variables and/or adjustment variables in the model.
4. Decide on the need to keep terms of interaction and/or adjustment variables in the model.
5. Correctly estimate and interpret the coefficients of a regression model.
6. Delimit the main aspects to be diagnosed when validating the model.
7. Know how to apply a principal-components analysis to reduce data dimensionality; correctly determine the number of components retained; optimal rotation of the said components; and perform an adequate interpretation of their meaning.
8. Understand the statistical analysis carried out in research papers that use predictive or explanatory statistical models, or data-reduction models.
9. Know the basic statistical vocabulary in Catalan, Spanish and English.
10. Know the basic elements of statistical analysis software.

Learning outcomes

- CM14 (Propose the statistical model needed to analyse data sets belonging to real studies.) Propose the statistical model needed to analyse data sets belonging to real studies.
- KM17 (Recognise the statistical models for the analysis of data with different structures and complexities that frequently appear in different fields of application.) Recognise the statistical models for the analysis of data with different structures and complexities that frequently appear in different fields of application.
- SM16 (Select appropriate sources of information for the statistical work.) Select appropriate sources of information for the statistical work.
- SM18 (Refine the information available for subsequent statistical processing.) Refine the information available for subsequent statistical processing.

Contents

- U1. Unifactorial Confirmatory Factor Analysis (CFA)
- U2. Multifactorial Confirmatory Factor Analysis (CFA)
- U3. Unidimensional Exploratory Factor Analysis (EFA)
- U4. Multidimensional Exploratory Factor Analysis (EFA)
- U5. Internal Consistency

- U6. Consistency or Agreement
- U7. Regression Models for Continuous Responses
- U8. Categorical predictors
- U9. Predictive models
- U10. Explanatory models
- U11. Model diagnosis and results communication
- U12. Regression Models for Binary Responses

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Reading the "Theory Schemes" for the preparation of theoretical classes	30	1.2	
Self-study: Completion of summaries, diagrams and conceptual maps	37.5	1.5	
Practical classes (small groups): approach and resolution of different practical problems of investigation analysis	26	1.04	
Practical review of the main analytical procedures of the course through the resolution of the practices	10	0.4	
Bibliographic and documentary consultations	7	0.28	
Theoretical classes: master class with multimedia support	19.5	0.78	
Monitoring and participation in discussion forums through the virtual campus	7.5	0.3	
Supervision of the resolution of the practices carried out autonomously	7.5	0.3	

This course provides different activities based on active-learning methodologies that are centred on the student (ALM). This involves a "hybrid" approach in which we combine traditional teaching resources with other resources aimed at encouraging meaningful and cooperative learning.

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Evidence 4: Writted evidence consisting of a set of multiple choice questions related to units 7-12, as well as tables with Jamovi (2nd assessment period); Written feedback provided in two weeks	40	2.5	0.1	CM14, KM17, SM16, SM18
Evidence 1. Individual delivery during the practice session of the results of the	15	0	0	CM14,

analysis of a practical problem related to topics 1-6 (approx. weeks 4-7); group return to the first post-evidence practice.				KM17, SM18
Evidence 3. Individual delivery during the practice session of the results of the analysis of a practical problem related to topics 7-12 (approx. weeks 13-17); group return to the first post-evidence practice.	15	0	0	CM14, KM17, SM18
Evidence 2: Written evidence consisting of a set of multiple choice questions related to units 1-6, as well as to the Jamovi tables that make the previous analysis (1st assessment period); Written feedback provided in two weeks	40	2.5	0.1	CM14, KM17, SM16, SM18

EV1 and EV3 consist of performing analyses with Jamovi based on a data matrix provided by the teaching team. It is carried out individually in the practical classroom. In order for an evidence to be evaluated, it will be necessary to have attended 2/3 of its practices in person. The weight of each of these evidences is 15%. The results of this evidence will be returned as a group on the first day of practice after the date of completion, and will consist of reviewing the solution and the most common errors.

The EV2 and EV4 (individual exams) consist of a set of approximately 25 multiple choice questions (three answer options, penalty for errors; two errors discount one correct, according to the usual criteria $k-1$). Students will be allowed to bring printed the material prepared by the teaching team as well as notes of the student's own elaboration. Electronic devices will not be available except for a calculator (not a mobile phone). At demand of the teaching staff, the students could have the statement and some Jamovi results tables a few hours before. The return of the results of this evidence will be carried out in groups and will consist of resolving each of the evaluation questions referring to the result tables obtained with Jamovi.

Although all assessment activities in this course are carried out in person, the teaching staff reserves the right to require an individual oral defense of any submitted evidence. This measure may be applied when there are reasonable indications that cast doubt on the authenticity, authorship, or integrity of the evidence. This includes, among other cases, possible inconsistencies in content or writing style, results that are incoherent with the student's other work, suspicion of non-original content, or signs of unauthorized copying or collaboration during the assessment. Such an oral defense may be required even when the evidence constitutes the sole assessment instrument for the student, as a mechanism to ensure the validity, reliability, and fairness of the evaluation process. If the oral defense is not successfully passed, the teaching staff may review the initial grade and, if deemed appropriate, annul the corresponding evidence.

The responses to all the evaluation evidence must be original (writings detected from other sources or copied or plagiarized responses will not be accepted). A breach of this condition implies the nullification of the evidence. More than one non-compliance will suppose a final qualification of 0 in the subject (in application to the regulations on evaluation of the UAB and of the Psychology degree. These measures will be applied to all the people involved in the evaluation irregularity.

In order to pass the subject through continuous assessment, the following criteria must be met: 1) The weighted sum of all the evidence must be equal to or greater than 5 points. 2) The average of EV2 and EV4 should be 4.5 or higher (on a scale of 0 to 10); otherwise the maximum grade in the course will be 4.5.

In accordance with the UAB regulations, students who have not passed the course and who meet: 1) have carried out evidence with a weight of at least 2/3 of the total and 2) have a continuous assessment mark 3.5 or higher, may be eligible for resit. The EV2 and/or EV4 can be recovered. The qualification of the recovered evidence will replace the previously obtained and the total qualification will be recalculated with the criteria aforementioned.

A student who has submitted evidence of learning with a weight equal to or greater than 4 points (40%) will be recorded as 'evaluable'.

No unique final synthesis test for students who enroll for the second time or more is anticipated.

The presentation of the translation of the of the statements of the in-person assessment tests will be carried out if the requirements established in Article 263 of the academic regulations are met and the request is made

in week 4 online (e-form) (more information on the faculty website).

The single assessment(AU) will take place on the same day and at the same location as the exam for the second assessment period of the students. All course content will be assessed. The same evidence will be used, and the final grade for the students will be calculated as described for continuous assessment, with the same weightings as indicated in the Continuous assessment. The total duration will be 3-4 hours. The single assessment must be requested online (e-form) during the specific period (more information on the faculty website).

Use of Artificial Intelligence: In accordance with the model established by the faculty regarding the use of artificial intelligence, it is considered permitted solely as a tool to support study and self-directed learning, but not allowed during the completion of any assessment evidence. All evaluations are conducted in person, and the use of any software other than JAMOVÍ is not authorized. Therefore, the use of AI-based technologies is restricted to the context of personal study, under the responsibility of the student, and it must be understood that such tools cannot be considered sources whose content has been validated by the teaching staff. Any irregularity committed in an assessment activity (including academic misconduct, plagiarism, or the improper use of artificial intelligence, unless such use is expressly authorized in the course syllabus) that may lead to a significant alteration of the assessment outcome will result in a grade of 0 (zero) for that assessment activity. If the course syllabus specifies that obtaining a minimum grade in that assessment activity is a mandatory requirement to pass the course, or if multiple irregularities are committed in the assessment activities of the same course, the final grade for the course will be 0 (zero). In addition, students who engage in any of these irregularities may be subject to disciplinary proceedings in accordance with the University's regulations.0.

Link to the assessment guidelines of the Faculty of Psychology and Speech Therapy:

https://www.uab.cat/doc/DOC_PautesAvaluacio_2026

Bibliography

Reference manuals:

Abad, F.J., Olea, J., Ponsoda, V. & García, C. (2011). *Medición en ciencias sociales y de la salud*. Madrid: Síntesis.

Kleinbaum, D.G., Kupper, L.L., Nizam, A., Muller, K. & Rosenberg, E.S. (2012). *Applied Regression Analysis and other Multivariable Methods*. (5ª ed.). Boston (MA): Cengage Learning, Inc.

Kleinbaum, D. G., Klein, M. (2010). *Logistic Regression : A Self-Learning Text* (3rd Edition). New York: Springer.

Ajenjo, C., Miguel, F.J., Grieria, O. (2021). Manual d'ús de Jamovi per anàlisi de dades en estudis socials. Bellaterra: Universitat Autònoma de Barcelona.

Losilla, J.M., Vives, J. (2023). Análisis de Datos con jamovi. Bellaterra: Universitat Autònoma de Barcelona.

Other references:

Domènech, J.M. & Granero, R. (2004). *Anàlisi de dades en Psicologia* (Vols. 1 i 2) (2ª Ed.). Barcelona: Signo.

Martínez Arias, R. (1995). *Psicometría: Teoría de los tests psicológicos y educativos*. Madrid: Síntesis.

Meltzoff, J. (2000). *Crítica a la investigación. Psicología y campos afines*. Madrid: Alianza Editorial. (Traducción del original de 1998).

Viladrich, M.C. & Doval, E. (Eds.) (2008). *Psicometría*. Barcelona: Edicions UOC.

Software

Jamovi

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE