

Data Analysis

Code: 102571
ECTS Credits: 6

2024/2025

Degree	Type	Year
2502443 Psychology	OB	2

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Teachers

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Teaching groups languages

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Prerequisites

In order to take advantage of the course "Data Analysis" it is necessary to have satisfactorily completed the subject "Research Methods, Designs and Techniques" ("MEDITI").

Objectives and Contextualisation

"Data Analysis" is the second methodological subject of the Psychology syllabus and belongs to the subject "Research Methods and Psychometrics". It is taught in the first semester of the second year and represents the natural continuation of the subject "Research Methods, Designs and Techniques", imparted in the first year of the degree. The course collects some methodological competences transferred in the subject "Statistics" and incorporates and develops new ones, with an aim for the students to broaden their skills base, an aspect that will allow them to complete the ensuing methodological subjects.

The general formative objectives of the course are:

1. To train students in the understanding of the conceptual foundations underlying the main statistical techniques that allow them to answer the questions that are usually posed by the professional and/or researcher in Psychology.
2. To rationally and correctly interpret the results derived from statistical analyses usually performed and published in prestigious scientific journals.
3. To integrate the concepts developed within the framework of statistical thinking as a formal structure of reasoning that facilitates the study of natural and psychological phenomena.

At the end of the course the student must be able to:

1. Reason within the framework of statistical thinking.
2. Know and use the vocabulary of data analysis correctly.
3. To understand the concept of uncertainty and probability in the field of psychological phenomenology.
4. Correctly formulate statistical hypotheses.
5. Identify the fundamental elements of statistical inference.
6. To understand the type of reasoning implicit in the statistical inference process.
7. Analyze and understand the risk involved in a statistical decision.
8. Decide which is the most appropriate statistical technique to test a hypothesis.
9. Correctly plan the most appropriate analysis strategy in each of the problem situations raised.
10. Adequately interpret the results obtained in a statistical analysis.

Competences

- Distinguish between the design of research, procedures and techniques to evaluate hypotheses, contrast them and interpret the results.

Learning Outcomes

1. Adequately interpret the results obtained from the application of univariable or bivariable statistical testing.
2. Evaluate and contrast models, instruments and techniques and decide which are the most appropriate for carrying out univariable or bivariable statistical analysis.
3. Identify the main models and techniques for univariable or bivariable statistical analysis and interpret the results obtained adequately.
4. Write up reasoned conclusions from the results obtained after applying univariable or bivariable statistical methods and techniques which offer an answer to a research hypothesis.

Content

1. Probability theory: fundamentals and diagnostic tests
2. Probability models
3. Statistical inference (I): estimation of parameters
4. Statistical inference (II): contrast of hypothesis
5. Inference with two categorical variables
6. Inference with a categorical and a quantitative variable: comparison of two means in independent samples.
7. Inference with two quantitative variables: correlation model
8. Data analysis in repeated measurement designs

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practical classes	18	0.72	4, 3, 1, 2
Theoretical classes	27	1.08	4, 3, 1, 2

Type: Supervised			
Review of problems	10	0.4	4, 3, 1, 2
Tutorials	13	0.52	4, 3, 1, 2
Type: Autonomous			
Cooperative learning	33	1.32	4, 3, 1, 2
Reading scripts	45	1.8	4, 3, 1, 2

The course "Data Analysis" implies the completion of 6 ECTS credits that represent a total of 150 hours for the student. Of this total, 45 hours will be dedicated to directed formative activities based on theoretical lectures and practical classes consisting in problem solving activities. A total of 18 hours will be dedicated to the revision of problems in seminar rooms and personal tutorials with the teachers. Different autonomous activities will be organized, including 72 hours of student dedication based on the reading of documents recommended by the professors and cooperative learning (group resolution of cases and problem-situations). The remaining 9 hours comprising the course will be dedicated to evaluation activities.

In summary: (1) teaching methodology: lectures, supervised practices, problem-based learning, and case exposition/discussion, and (2) training activities: case studies and technical-scientific lectures.

Note: 15 minutes of a class will be reserved, within the calendar established by the center/degree, for the completion of the evaluation surveys about the teacher's performance and the evaluation of the subject/module by the students.

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	Weighting	Hours	ECTS	Learning Outcomes
Distinction-grade	Qualitative assessment	0	0	4, 3, 1, 2
EV1 Instrumental assessment units 1 to 4	5%	0	0	4, 3, 1, 2
EV2 Theoretical and instrumental assessment, units 1 to 4	45%	2	0.08	4, 3, 1, 2
EV3 Instrumental assessment, units 5 to 8	5%	0	0	4, 3, 1, 2
EV4 Theoretical and instrumental assessment, units 5 to 8	45%	2	0.08	4, 3, 1, 2

Continuous assessment: The marking of the students is based on a continuous assessment process that allows the evaluation of the degree to which they acquire the competences trained in the course. It is based on the performance and delivery of a series of learning evidence associated to different assessment

modalities at different times along the semester. This format provides students and teachers with immediate feedback on the level of competencies acquired throughout the course and the degree of improvement in academic performance. In order to complete the course, students must prove satisfactory performance in two compulsory tests (EV2 and EV4) of individual authorship and two instrumental or practical evaluation tests (EV1 and EV3) of group authorship.

The EV2 and EV4 tests are carried out in person at the place and date set by the Faculty in the first and second evaluation period respectively. These tests evaluate, by means of multiple-choice tests consisting of 40-45 questions, all the contents of the subject considering both the theoretical and instrumental aspects. EV2 evaluates topics 1 to 4 of the syllabus and EV4 evaluates the remaining topics (5 to 8). The instrumental or practical evidence, EV1 and EV3, will be carried out approximately one or two weeks before EV2 and EV4, respectively. EV1 and EV3 consist of the exposition and subsequent resolution of a problem-situation that each work team, the members of which will be chosen by the teachers at the beginning of the course within each group of practices, will have been working on during the course. In this sense, EV1 will evaluate the practical aspects of topics 1 to 4 and EV3 those corresponding to topics 5 to 8. In order to be able to present each of these evidence, the work team will need to have delivered the list of exercises-problems called "complementary problems" solved, available in the practice material of the subject.

To determine the final grade of the course (FG) the weighted contributions of the respective learning evidence will be considered, so that EV1 contributes 5% to the final grade of the course, EV2 45%, EV3 5%, and EV4 45%. Therefore: $FG = EV1(0.10) + EV2(0.35) + EV3(0.10) + EV4(0.45)$. The students who have completed the learning evidence with a weight equal to or higher than 4 points (40%) cannot be recorded as "non-assessable". Therefore, in order to pass the course following the continuous assessment, the following criteria must be met:

1. The weighted sum of all the evidence must be equal or superior to 5 points.
2. The arithmetic average of EV2 and EV4 must be 4.5 points or higher (on a scale from 0 to 10), otherwise the maximum grade in the course will be 4.5.
3. In accordance with UAB regulations, students who have not passed the course and who meet the following conditions will be eligible for a reparatory exam:
 - a. To have carried out the evidence with a weight of at least 2/3 of the total and to have a continuous evaluation grade of 3.5 points or higher.
 - b. EV2 and/or EV4 evidence can be made up.
 - c. The grade of the made-up evidence(s) will replace the grade obtained previously and the total grade will be recalculated using the criteria described.

The students with a final grade higher or equal to 5 points will not be allowed to take the reparatory exam in order to increase the final grade obtained during the continuous assessment. The decision to re-sit one or both evidences (EV2 and/or EV4) is up to the student. The reparatory exam(s) of EV2 and EV4 will have the same format and contents as the original tests. The grade(s) obtained in the reparatory exam(s) will replace the grade(s) obtained initially in the previous evaluations carried out during the course (EV2 and/or EV4).

The students who have obtained a final grade equal to or higher than 9 points will be eligible for the qualification "With high Honors". These students will have to take a complementary evaluation test, in person and in oral format. This test will be carried out at the same time as the reparatory exam. The conditions, characteristics and dynamics of the test to opt for the qualification of "With high Honors" will be specified to the people involved days before the test. The teaching team recommends the students of 2nd or subsequent enrollments who cannot easily follow the established continuous assessment procedure, to request the completion of a final non-reparable synthesis test that includes the entire syllabus. The students who wish to take this type of evaluation, and who meet the requirements (second or subsequent enrollment), must request it in writing (email) to the course coordinator before the end of week 4.

Single evaluation: the students who consider it appropriate may opt for the single evaluation modality. This type of evaluation implies that on a single evaluation date all the evidence/learning activities will be carried out, with the same considerations, weightings and requirement level as those corresponding to the continuous assessment. The students enrolled in this type of assessment can attend classes and some of the sessions may even be compulsory. The single evaluation test will take place on the same date as the EV4 evaluation and, if necessary, the students may opt for a reparatory exam on the date set by the

Faculty and the same recovery process as that of the continuous assessment will be applied. The duration of the single evaluation test is estimated between five and six hours. It should be noted that EV1 and EV3 are not recoverable.

Therefore, and in summary:

1. The request for a single evaluation implies the waiver to the continuous assessment and implies the delivery on a single date of the necessary number of evaluative evidence to accredit and guarantee the achievement of the objectives and learning outcomes established in the course.
2. The single evaluation must have the same requirement level as the continuous assessment. The student has the same rights as with the continuous assessment in relation to teaching, grading and, if necessary, re-sitting.
3. To apply for the single evaluation, students must submit a reasoned request to the school before week 4 of the four-month period.

Continuous assessment: The marking of the students is based on a continuous assessment process that allows the evaluation of the degree to which they acquire the competences trained in the course. It is based on the performance and delivery of a series of learning evidence associated to different assessment modalities at different times along the semester. This format provides students and teachers with immediate feedback on the level of competencies acquired throughout the course and the degree of improvement in academic performance.

In order to complete the course, students must prove satisfactory performance in two compulsory tests (EV2 and EV4) of individual authorship and two instrumental or practical evaluation tests (EV1 and EV3) of group authorship.

The EV2 and EV4 tests are carried out in person at the place and dates set by the Faculty in the first and second evaluation period respectively.

These tests evaluate, by means of multiple-choice tests consisting of 40-45 questions, all the contents of the subject considering both the theoretical and instrumental aspects. EV2 evaluates topics 1 to 4 of the syllabus and EV4 evaluates the remaining topics (5 to 8).

The instrumental or practical evidence, EV1 and EV3, will be carried out approximately one or two weeks before EV2 and EV4, having been working on during the course. In this sense, EV1 will evaluate the practical aspects of topics 1 to 4 and EV3 those corresponding to topics 5 to 8. In order to be able to present each of these evidences, the work team will need to have delivered the list of exercises-problems called "complementary problems" solved, available in the practice material of the subject.

To determine the final grade of the course (FG) the weighted contributions of the respective learning evidence will be considered, so that EV1 contributes 5% to the final grade of the course, EV2 45%, EV3 5%, and EV4 45%. Therefore: $FG = EV1(0.10) + EV2(0.35) + EV3(0.10) + EV4(0.45)$. The students who have completed the learning evidence with a weight equal to or higher than 4 points (40%) cannot be recorded as "non-assessable". Therefore, in order to pass the course following the continuous assessment, the following criteria must be met:

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2. The arithmetic average of EV2 and EV4 must be 4.5 points or higher (on a scale from 0 to 10), otherwise the maximum grade in the course will be 4.5.
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 - a. To have carried out the evidence with a weight of at least 2/3 of the total and to have a continuous evaluation grade of 3.5 points or higher.
 - b. EV2 and/or EV4 evidence can be made up.
 - c. The grade of the evidence(s) will replace the grade obtained previously and the total grade will be recalculated using the

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Single evaluation: the students who consider it appropriate may opt for the single evaluation modality. This type of evaluation implies that on a single evaluation date all the evidence/learning activities will be carried out, with the same considerations, weightings and requirement level as those corresponding to the continuous assessment. The students enrolled in this type of assessment can attend classes and some of the sessions may even be compulsory. The single evaluation test will take place on the same date as the EV4 evaluation and, if necessary, the students may opt for a reparatory exam on the dates set by the Faculty and the same recovery process as that of the continuous assessment will be applied. The duration of the single evaluation test is estimated between five and six hours. It should be noted that EV1 and EV3 are not recoverable.

Therefore, and in summary:

1. The request for a single evaluation implies the waiver to the continuous assessment and implies the delivery on a single date of the necessary number of evaluative evidence to accredit and guarantee the achievement of the objectives and learning outcomes established in the course.
2. The single evaluation must have the same requirement level as the continuous assessment. The student has the same rights as with the continuous assessment in relation to teaching, grading and, if necessary, re-sitting.
3. To apply for the single evaluation, students must submit a reasoned request to the school in the fixed period.

Bibliography

Reference manuals:

Cumming, G., i Calin-Jageman, R. (2024). *Introduction to the new statistics: estimation, open science, and beyond* (2ª ed.). New York: Routledge-Taylor & Francis.

Pardo, A., Ruiz, M.A., i San Martín, R. (2009). *Análisis de datos (I) en ciencias sociales y de la salud*. (2ª ed.). Madrid: Editorial Síntesis.

Further reading:

Ellis, P.D. (2010). *The essential guide to effect sizes*. Cambridge: Cambridge University Press.

Kline, R.B. (2009). *Becoming a behavioral science researcher*. London: The Guilford Press.

Kline, R.B. (2013). *Beyond Significance Testing: Statistics Reform in the Behavioral Sciences*. Washington, DC: American Psychological Association.

Pardo, A., Ruiz, M.A., i San Martín, R. (2010). *Análisis de datos (II) en ciencias sociales y de la salud*. (2ª ed.). Madrid: Editorial Síntesis.

Peña, D. (2001). *Fundamentos de estadística*. Madrid: Alianza Editorial.

Solanas, A., Salafranca, L.I., Fauquet, J., i Nuñez, M.I. (2005). *Estadística Descriptiva en Ciencias del Comportamiento*. Madrid: Thomson.

Software

The basic program used in the course is the statistical program STATA (V18). This program is the basic tool with which the various studies/problems posed by the course will be carried out. Complementarily, the student will have the possibility to study/deepen in two statistical programs of free distribution. These programs are the JASP system (<https://jasp-stats.org/>) and the JAMOVl program (<https://www.jamovi.org/>).

Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	11	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	12	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	21	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	22	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	31	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	32	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	41	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	42	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	51	Catalan/Spanish	first semester	morning-mixed
(PAUL) Classroom practices	52	Catalan/Spanish	first semester	morning-mixed
(TE) Theory	1	Catalan/Spanish	first semester	morning-mixed
(TE) Theory	2	Catalan/Spanish	first semester	morning-mixed
(TE) Theory	3	Catalan/Spanish	first semester	morning-mixed
(TE) Theory	4	Catalan/Spanish	first semester	morning-mixed
(TE) Theory	5	Catalan/Spanish	first semester	morning-mixed