
DEGREE CURRICULUM

# INFERENTIAL STATISTICS IN PSYCHOLOGY

Coordination: MARCH LLANES, JAUME

Academic year 2020-21

# INFERENTIAL STATISTICS IN PSYCHOLOGY 2020-21

## Subject's general information

<table>
<tr><td>Subject name</td><td>INFERENTIAL STATISTICS IN PSYCHOLOGY</td></tr>
<tr><td>Code</td><td>102909</td></tr>
<tr><td>Semester</td><td>1st Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's Degree in Psychology</td><td>2</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><th>PRAULA</th><th>TEORIA</th></tr>
<tr><td>Number of credits</td><td>2.4</td><td>3.6</td></tr>
<tr><td>Number of groups</td><td>2</td><td>1</td></tr>
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</td></tr>
<tr><td>Coordination</td><td>MARCH LLANES, JAUME</td></tr>
<tr><td>Department</td><td>PSICOLOGIA</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
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# INFERENTIAL STATISTICS IN PSYCHOLOGY 2020-21

| Teaching staff | E-mail addresses | Credits taught by teacher | Office and hour of attention |
|---|---|---|---|
| MARCH LLANES, JAUME | jaume.march@udl.cat | 8,4 | |

## Learning objectives

Learning outcomes:

- Know how to differentiate the objectives of descriptive statistics and inferential statistics.
- Understand the sample distribution as a concept that allows you to relate a statistic and a parameter.
- Differentiate between estimation of time and interval parameters.
- Understand the different concepts related to the contrast of hypotheses. Hypothesis and statistical decision. Contrast statistic Types of errors in the decision. Power. Critical values and level of significance. Type of contrast
- Correctly put forward a hypothesis contrast for a proportion, an average, and a variance.
- Prepare and perform the relevant calculations for the study of the relationship between two categorical variables.
- To formulate and carry out the relevant calculations for the study of the relationship between an independent variable dichotomous and a quantitative dependent variable.
- To formulate and carry out the relevant calculations for the study of the relationship between an independent political variable and a quantitative dependent variable.
- Prepare and perform the relevant calculations for the study of the relationship between two quantitative variables.
- Properly plan a study with several independent variables, and perform the calculations applying the General Linear Model using a statistical package.
- Properly plan a study with several independent variables, and perform the calculations by applying Classification Trees.

## Competences

Basic skills:

CB1 Owning and understanding knowledge in a study area that is based on the general secondary education base, and it is often found at a level that, while supported by advanced textbooks, also includes some aspects that involve relevant knowledge from the vanguard of his field of study.

CB2 Apply their knowledge to their work or vocation in a professional way and possess the competencies that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.

CB3 Ability to gather and interpret relevant data (usually within its area of study) to issue judgments that reflect on relevant issues of a social, scientific or ethical nature.

CB4 Power to convey information, ideas, problems and solutions to a specialized and non-specialized audience.

General Competences:

CG1 Develop the ability to adapt to new situations and solve problems in an effective way.

CG2 Develop the ability to work in multidisciplinary teams and collaborate efficiently with other professionals.

CG3 Show abilities for interpersonal relationships.

CG5 Demonstrate critical capacity to make relevant decisions.

CG6 Reflect on own limitations in a self-critical way, considering the possibility of requesting interdisciplinary collaborations.

CG7 Act with creativity, research culture and professional communication.

CG9 Recognize diversity and difference as a structural element of the human being, while recognizing, understanding and respecting the cultural complexity of today's society.

Specific Competences:

CE1 Identify and analyze the characteristics and needs of people, groups and organizations, as well as relevant contexts for the requested service.

CE2 Plan the evaluation of programs and / or psychological interventions, selecting Indicators and appropriate techniques.

CE4 Analyze and interpret the results of the psychological evaluation.

CE6 Respond and act appropriately and professionally, taking into account the attitudes and values of the profession, as well as its ethical and ethical code, in each and every one of the intervention processes.

CE7 Provide information to users and establish an appropriate interpersonal relationship, taking into account the different contexts of professional relationship.

CE8 Prepare technical reports, oral and written, about the results of the process of evaluation, research or services demanded, respecting the ethical commitment that demands the dissemination of psychological knowledge.

CE9 Use the different documentary sources in psychology, show a mastery of the strategies necessary to access information and assess the need for documentary update.

CE10 Manage, analyze and interpret data in the frameworks of disciplinary knowledge typical of the different fields of psychology.

CE11 Making decisions critically about the choice, application and interpretation of the results derived from the different methods of psychological research.

CE12 Disseminate knowledge derived from the theoretical reviews and the results of psychological research.

Transversal Competences:

CT1 Acquire adequate oral and written comprehension and expression of Catalan and Spanish.

CT3 Acquire training in the use of new technologies and information and communication technologies.

CT5 Acquire essential notions of scientific thought.

## Subject contents

Block 1 Fundamentals of inferential statistics

C1. From descriptive statistics to inferential statistics. Introduction to statistical software.

C2. Discrete and continuous probability distributions. Sample distribution.

C3. Parameter estimation. Confidence intervals.

C4. Hypothesis testing.

Block 2 Univariate inferential statistics.

C5. Categorical data such as RV and VI: Binomial test, Z, Chi-square.

C6. Quantitative measures such as R&D and VI dichotomy: Student-Fischer t. Non-parametric alternatives.

C7. Quantitative measures such as RV and multinomial VI: ANOVA. Introduction to the control of confusing variables: ANCOVA.

C8. Quantitative measures as RV and as VI: Linear Regression.

Block 3 Multivariate inferential statistics.

C9. Inferential Statistics in Scientific Publications: Effect Size, Power, and Sample Size necessary to make a study.

C10. Parameter: Multiple linear regression. Examples of generalizations of the basic linear model: Logistic Regression.

C11. Non-parametric: Classification Models. Cluster Techniques and Classification Trees.

## Methodology

- Master classes based on reverse classroom. First the students do some practical exercises and then the theory involved will be explained.
- Work in group
- Written work
- Resolution of practical problems

## Development plan

Formative activity

Hours allocated to the training activity (classroom 60/ Individual90)

| | | |
|---|---|---|
| Theoretical classes in person | 26 | 20 |
| Practical classes in person | 26 | 15 |
| Tutorials | 4 | 5 |
| Reading and analysis of texts | 0 | 15 |
| Elaboration of group work | 4 | 15 |
| Study and preparation of evaluation tests | 0 | 15 |

60 90

## Evaluation

Evaluation system:

| Evaluation system | % | week |
|---|---|---|
| East Test. Multifactorial | 30 | s16 + REC S18 |
| Test Unifactorial Hypothesis Tests | 25 | s11 + REC S18 |
| Parameter Estimation Test | 20 | s6 + REC S18 |
| Group work + Activities | 25 | s15 |

The tests, all practical, account for more than 30% of the total mark. Therefore they recover.
Group work has no recovery.
The pass is obtained by exceeding 50% of the total mark, provided that you also obtain 4 points out of 10 in each test that exceeds 30% of the total.

Alternative evaluation:

| Evaluation system | % | week |
|---|---|---|
| East Test. Multifactorial | 35 | s16 + REC S18 |
| Test Unifactorial Hypothesis Tests | 35 | s11 + REC S18 |
| Parameter Estimation Test | 30 | s6 + REC S18 |

The approved one is obtained surpassing 50% of the total note, with condition of also surpassing 40% of each test.

## Bibliography

Recommended bibliography:

Navarro DJ and Foxcroft DR (2019). learning statistics with jamovi: a tutorial for psychology students and other beginners. (Version 0.70). DOI: 10.24384/hgc3-7p15

Miguel Ángel Martínez González (dir.), Almudena Sánchez Villegas (dir.), Estefanía Toledo Atucha (dir.), Francisco Javier Faulín Fajardo (dir.) Bioestadística amigable. Elsevier España. 2014 ISBN: 978-84-9022-500-4

https://www.jamovi.org/

Basic bibliography:

Zaiats V., Calle L., Presas, R. (1998) Probabilitat i estadística: exercicis I. Vic : Eumo. Només capítol 4

Zaiats V., Calle L. (2001) Probabilitat i estadística: exercicis II. Bellaterra : Universitat Autònoma de Barcelona. Tots els capítols (del 5 a 9)

Introductory bibliography:

Aron, A. i Aron, E.N. (2001) Estadística para Psicología. Buenos Aires: Pearson Educación,

Botella, J., León. D.G. & San Martín, R. (2001). Análisis de datos en psicología I. Madrid: Pirámide.

Domènech, J.M. y Granero, R. (2008). Anàlisi de dades en Psicologia per a la recerca en Psicologia. Vol. 1: Fonaments. Barcelona: Signo.

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Guàrdia, J.; Freixa, M.; Peró, M. & Turbany, J. (2008). Análisis de Datos en Psicología (2ª Edición). Madrid: Delta.

Losilla, J.M., Navarro, J.B., Palmer, A., Rodrigo, M.F. y Ato, M. (2005). Del contraste de hipótesis al modelado estadístico. Girona: Documenta Universitaria (EAP, S.L.). ISBN: 84-96367-19-3

Salafranca, Ll., Sierra, V., Núñez, M.I., Solanas, A. & Leiva, D. (2005). Análisis estadístico mediante aplicaciones informáticas. SPSS, StatGraphics, Minitab y Excel. Barcelona: Edicions de la Universitat de Barcelona.

Spiegel, M. (2001). Teoría y problemas de probabilidad y estadística. México: McGraw-Hill.