Guía docente de la asignatura

Metodología en Neurociencia Cognitiva: Investigación Básica y Aplicada (M30/56/2/27)

Fecha de aprobación por la Comisión Académica: 28/06/2023

Máster	Máster Universitario en Neurociencia Cognitiva y del Comportamiento
MÓDULO	Metodológico
RAMA	Ciencias de la Salud
CENTRO RESPONSABLE DEL TÍTULO	Escuela Internacional de Posgrado

Semestre	Primero	**Créditos**	4	**Tipo**	Optativa	**Tipo de enseñanza**	Presencial

PRERREQUISITOS Y/O RECOMENDACIONES

- It is recommended for the student to have English skills sufficient to follow lessons and actively participate in them.
- It is recommended for the student to have above-average general software use skills.

BREVE DESCRIPCIÓN DE CONTENIDOS (Según memoria de verificación del Máster)

PHASE A. PROGRAMMING AN EXPERIMENT:

1. Introduction: Aim of the study, experimental design, formulation of hypotheses
2. Training in experiment programming using E-prime
3. Individual programming of an experiment, and problem-solving throughout the process

PHASE B. STATISTICAL ANALYSIS:

4. Data pre-processing using E-prime and Excel: Filtering, central and dispersion statistics
5. Data Analyses I: Descriptive statistics using statistical software
6. Data Analyses II: Hypothesis testing using statistical software (ANOVA, ANCOVA, regression, statistical assumptions)
7. Data and hypothesis management: Questionable (ex-post facto hypotheses, inadequate sample size, fishing, partial report of measures) and recommendable research practices

(pre-register, open data repositories, null results reports)

COMPETENCIAS

COMPETENCIAS BÁSICAS

- CB6 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación.
- CB7 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio.
- CB8 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios.
- CB9 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades.
- CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

RESULTADOS DE APRENDIZAJE (Objetivos)

- Students must learn to use specialized software for programming experiments and data analyses
- Students must be able to:
    - Critically evaluate the quality of basic and applied research (experimental control, designs, questionable research practices, etc.)
    - Program experiments
    - Work with quantitative data: summarizing, classifying, plotting, and presenting these data to an audience.
    - Manage data, hypotheses and results from an ethical perspective

PROGRAMA DE CONTENIDOS TEÓRICOS Y PRÁCTICOS

TEÓRICO

- **Block 1. Programming an experiment with E-Prime or similar open-source software (OpenSesame, PsychoPy etc.).:**
    - **Unit 1.** Introduction: Aim of the study, experimental design, formulation of hypotheses
    - **Unit 2.** Training in experiment programming
    - **Unit 3.** Individual programming of an experiment, and problem-solving throughout the process
- **Block 2. Statistical analysis:**
    - **Unit 4.** Recommended practices in Psychology and Neuroscience

- **Unit 5.** Data Analyses I: Data preprocessing and descriptive statistics with statistical software
- **Unit 6.** Data Analyses II: inferential analyses with statistical software

PRÁCTICO

All units are simultaneously theoretical and practical, and include tasks to apply the acquired knowledge to simulated cases.

BIBLIOGRAFÍA

BIBLIOGRAFÍA FUNDAMENTAL

Block 1

- Mathôt, S., Schreij , D., & Theeuwes, J. (2012). OpenSesame: An open-source, graphical experiment builder for the social sciences. Behavior Research Methods, 44, 314-324.
- Schneider, W., Eschman, A., & Zuccolotto, Z. (2002). E-Prime user's guide (Version 1.1). Psychology Software Tools

Block 2

- Cumming, G. (2012). Understanding the new statistics: Effect sizes, confidence intervals, and meta-analysis. Routledge. https://granatensis.ugr.es/permalink/34CBUA_UGR/1p2iirq/alma991006083639704990
- Field, A. (2016). An adventure in statistics. SAGE. https://granatensis.ugr.es/permalink/34CBUA_UGR/1egp27c/alma991009308549704990
- Kurt, W. (2019). Bayesian statistics the fun way. No Starch Press, Inc. https://granatensis.ugr.es/permalink/34CBUA_UGR/1p2iirq/alma991014106019104990

BIBLIOGRAFÍA COMPLEMENTARIA

- Dienes, Z. (2008). Understanding psychology as a science: An introduction to scientific and statistical inference. Macmillan International Higher Education.
- Field, A., Miles, J., & Field, Z. (2012). Discovering statistics using R. SAGE.
- Open Science Collaboration (2015). Estimating the reproducibility of psychological science. Science, 349, aac4716.
- Pownall, M. et al. (2021). Navigating open science as early career feminist researchers. Psychology of Women Quarterly, 45, 526-539.

ENLACES RECOMENDADOS

- Danielle Navarro (2020). R for Psychological Science. https://psyr.djnavarro.net/
- Mark Goss-Sampson. (2019). Statistical analysis in JASP: A guide for students. Recovered

from:
- https://gala.gre.ac.uk/id/eprint/25585/7/25585%20GOSS-SAMPSON_Statistical_Analysis_In_JASP_A_Guide_For_Students_%28Pub%29_2019.pdf
- The jamovi project (2022). jamovi (Version 2.3) [Computer Software]. Retrieved from https://www.jamovi.org
- Prado https://prado.ugr.es/

EVALUACIÓN (instrumentos de evaluación, criterios de evaluación y porcentaje sobre la calificación final)

EVALUACIÓN ORDINARIA

[Article 18 of the UGR Assessment Policy and Regulations establishes that the ordinary assessment session (convocatoria ordinaria) will preferably be based on the continuous assessment of students, except for those who have been granted the right to a single final assessment (evaluación única final), which is an assessment method that only takes a final exam into account.]

PHASE A: 50% of the total score

- Participation/attendance in discussion sessions and student attitude in class : 15%
- In class individual assignments 15%
- Final individual assignments 20%

PHASE B. 50% of the total score

- Participation/attendance in discussion sessions and student attitude in class : 15%
- In class individual assignments 15%
- Final individual assignments 20%

Individual assignments must be handed before the due date. Late work will be accepted with a 20% penalty.

A minimum of 25% in each phase is required to pass the course.

If students do not reach the minimum required in each part of the course, their maximum score will be 49% (4,9) of the total score.

EVALUACIÓN EXTRAORDINARIA

[Article 19 of the UGR Assessment Policy and Regulations establishes that students who have not passed a course in the ordinary assessment session (convocatoria ordinaria) will have access to an extraordinary assessment session (convocatoria extraordinaria). All students may take part in this extraordinary assessment session, regardless of whether or not they have followed continuous assessment activities. In this way, students who have not carried out continuous assessment activities will have the opportunity to obtain 100% of their mark by means of an exam and/or assignment].

For the extraordinary assessment, the student must submit all the previously described individual assignments. The qualification percentages will be kept up to a maximum of 10

(100%), once participation/attendance is disregarded.

EVALUACIÓN ÚNICA FINAL

[Article 8 of the UGR Assessment Policy and Regulations establishes that students who are unable to follow continuous assessment methods due to justifiable reasons shall have recourse to a single final assessment (evaluación única final), which is an assessment method that only takes a final exam into account. In order to opt for a single final assessment (evaluación única final), students must send a request, using the corresponding online procedure, to the coordinator of the master's programme, in the first two weeks of the course or in the two weeks following their enrollment (if the enrollment has taken place after the classes have already begun). The coordinator will communicate this information to the relevant teaching staff members, citing and verifying the reasons why the student is unable to follow the continuous assessment system.]

For the single final assessment, the student must submit all the previously described individual assignments. The qualification percentages add up to a maximum of 10 (100%), once participation/attendance is disregarded.

INFORMACIÓN ADICIONAL

Teaching methodologies:

- MD01 Lectures
- MD02 discussion and debate sessions
- MD03 Problem solving and practical case examples
- MD06 Simulation exercises

Learning activities and timing:

- Classes: 36 h
  - Teacher presentations: 16 h
  - Student problem resolution and practical examples: 20 h
- Autonomous learning: 64 h
  - Student individual work: 64 h

The teaching methodology and assessment will be adapted to students with specific needs (SEN), in accordance with Article 11 of the Regulations on assessment and grading of students at the University of Granada.

This course will follow the recommendations from the UGR Action Plan for Equality regarding the use of nonsexist and inclusive language and visibility of women's and minorities' contributions to the field.

Información de interés para estudiantado con discapacidad y/o Necesidades Específicas de Apoyo Educativo (NEAE): Gestión de servicios y apoyos (https://ve.ugr.es/servicios/atencion-social/estudiantes-con-discapacidad).