

**COURSE UNIT**

Research Methods In Neuropsychology

**HEAD LECTURER**

Ana Raposo

**ACADEMIC STAFF**

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**LEARNING OUTCOMES**

The goal of this course is to introduce the methodological bases of experimental neuropsychology. Students should be able to critically evaluate the promises and limitations of the various techniques used to study brain-mind relationships; Discuss and evaluate current models and empirical results on specific topics in cognition and brain (eg, injury, psychophysics, MRI, EEG, TMS).

**SYLLABUS**

1. Introduction to the scientific method.
2. Introduction to neuroimaging.
3. Introduction to electroencephalography and evoked potentials.
4. Introduction to neuromodulation.
5. Intra-operative mapping.
6. Experimental programming software: Presentation; E-Prime; PsychPy
7. Data analysis software: Matlab; Fieldtrip; SPM.
8. Experimental paradigms for the study of cognition, social cognition and emotional processes.

**TEACHING METHODS**

This course will involve intensive workshops that will include: (1) presentation of current state of the art, combined with discussion of practical examples and research results; (2) practice of experimental programming skills; (3) identification of a research problem in neuropsychology and planning of an experiment focused on the research question under analysis.

**ASSESSMENT METHODS**

Assessment includes three components:

1. Attendance and participation in the workshops (10%);
2. Short answer questions about the research methods discussed in the course (40%);
3. Research report on a study proposed by the student using one of the research methods addressed in the course (50%).

**BIBLIOGRAPHY**

1. Luck, S. J. (2014). An Introduction to the Event-related Potential Technique (2nd edition). Cambridge: MIT.
2. Newman, A. (2019). Research Methods for Cognitive Neuroscience. SAGE Publications. Dalhousie University, Canada.
3. Schneider, W., Eschman, A., & Zuccolotto, A. (2012). E-Prime User's Guide (version 2). Pittsburgh: Psychology Software Tools, Inc.
4. Wallisch, P., Lusignan, M., Benayoun, M., Baker, T. I., Dickey, A. S., & Hatsopoulos, N. G. (2009). Matlab for Neuroscientists: An Introduction to Scientific Computing in Matlab. Academic Press, Elsevier, Burlington, Massachusetts, USA.
5. Wixted, J.E., & Wagenmakers, E.J. (2018). Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience, Volume 5, Methodology, 4th Edition. John Wiley & Sons. New York, USA.

Other references will be given throughout the course.