GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2018-2019

Case Studies in the Analysis of Experimental Data (H002003)

Course size (nominal values; actual values may depend on programme)

Credits	4.0	Study time	120 h	Contact hrs	30.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	English	project	20.0 h
		microteaching	6.25 h
		lecture	3.75 h

Lecturers in academic year 2018-2019

Marinazzo, Daniele	PP01	lecturer-in-charge
Moerkerke, Beatrijs	PP01	co-lecturer
Rosseel, Yves	PP01	co-lecturer

Offered in the following programmes in 2018-2019	crdts	offering
Master of Science in Psychology (main subject Theoretical and Experimental Psychology)	4	A
Exchange Programme in Psychology	4	A

Teaching languages

English

Keywords

Hands-on data-analysis
Reproducibility
Data-Management

Position of the course

This course is the final one in the second master (Theoretical and Experimental Psychology). It's aimed to put in practice the competences acquired in the previous years by completing a project using tools for open and reproducible science.

Contents

This course covers the following topics:

- Reproducibility and automation of scientific results
- Hands-on advanced analysis of behavioral data
- Hands-on analysis of neuroimaging data: EEG
- Hands-on analysis of neuroimaging data: fMRI

Initial competences

Analysis of Repeated Measures
Analysis of Neuroimaging Data

Final competences

1 Independently choose a suitable data-analytical procedure.

2 Independently analyse and interpret research results.

3 Relate research results to the original research question.

4 Produce high quality reports on research data, both in writing and oral presentations.

5 Implement a reproducible research pipeline when analysing research data.

6 Use data-management to enable long-term storage, access and use of research data.

7 Make one's own research data and implemented data-analytical procedures available to colleagues.
8 Aim to transparency when analysing research data.

9 Learn to use new tools, or an analysis tool already used, but implemented in another software

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture, microteaching, project

Extra information on the teaching methods

- Lecture: theory on reproducibility and automation of scientific results
- Project: Individual hands-on analysis of a case study with either behavioral, EEG or fMRI data, resulting in the methods and results section of a scientific paper
- Microteaching: students of each group spend some hours together working on their projects, exchanging ideas and comparing code and results

Learning materials and price

Slides, scripts and datasets available through Minerva or another online repository (for data).
Estimated Cost 10 EURO

References

- Agresti, A. (2013). Categorical Data Analysis, 3rd Edition. Wiley.
- Cousineau, D., Brown, S. & Heathcote, A. (2004). Fitting distributions using maximum likelihood: Methods and packages. Behavior Research Methods, Instruments, & Computers, 36(4), 742-756
- Lazar, N. A. (2008). The statistical analysis of functional MRI data. New York: Springer
- Loeys, T., Rosseel, Y., Baten, K. (2011). A joint modeling approach for reaction time and accuracy in psycholinguistic experiments. Psychometrika, 76(3), 487-503.
- Cohen, Mike X (2014). Analyzing Neural Time Series Data. MIT Press, Cambridge, MA.
- Poldrack, R. A., Mumford, J. A., Nichols, T. E. (2011). Handbook of functional MRI Data Analysis. Cambridge UP.
- Van Drongelen, W. (2007). Signal Processing for Neuroscientists. AP.
- Van Zandt, T. (2000). How to fit a response time distribution. Psychonomic Bulletin & Review, 7(3), 424-465.
- Vandekerckhove, J., Tuerlinckx, F., & Lee, M. D. (2011). Hierarchical diffusion models for two-choice response times. Psychological Methods, 16, 44-62

Course content-related study coaching

By appointment

Evaluation methods

end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period

Oral examination, assignment

Examination methods in case of periodic evaluation during the second examination period

Oral examination, assignment

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

- Assignment: Evaluation of the written results of the project
- Oral Examination: Oral defense of the project

Calculation of the examination mark

50% oral examination and 50% assignment.

Students who eschew one or more parts of the evaluation can no longer pass the

course. Final scores will be reduced to the highest non-deliberative quotation (7/20) in case the final score is higher.