UCLouvain

# lpsys2168

*2023*

# Advanced workshops of analysis methods - Graph theory & Network analyses

| 2.00 credits | 15.0 h | Q2 |
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| Teacher(s) | Heeren Alexandre ; |
| Language : | English |
| Place of the course | Louvain-la-Neuve |
| Learning outcomes | |
| Evaluation methods | First session: Oral test about theorical aspects and use of R to do network analysis (9 points /20), oral presentation and review of a research paper using network analytical tools (9 points / 20), and continuous assessment via homeworks (2 points / 20)<br>Second session: Oral test (20 points /20) |
| Teaching methods | Teaching and assessment will be delivered via a classroom setting, on the Louvain-la-Neuve campus, but could be carried out remotely (via Teams) should the health situation require to do so. |
| Content | Graph theory and network analysis have started to infiltrate psychological sciences, especially in research agendas dealing with large datasets. Accordingly, this course will provide a general overview of the application of graph theory and network analysis in psychological sciences. Applications on real data sets will be provided throughout the workshop. Given the audience's diversity, illustrations will range from social networks to brain networks and symptoms networks.<br>Through this course, participants will:<br>- become familiar with general notions of graph theory and network analysis<br>- learn how to model network data using R, to implement algorithms from the field of graph theory (e.g., community detection, small-wordness), and to use up-to-date tools from statistical network analysis (e.g., graphical Lasso, subset bootstrap, Bayesian modeling) to optimize network estimation and visualization<br>- understand the advantages, challenges, and limitations of network analysis in comparison to other analytical approaches<br>- and become able to critically assess papers dealing with network analysis and graph theory in psychological sciences. |
| Inline resources | Handouts, as well as examples of R programming codes, will be made available via Moodle. |
| Bibliography | A list of reading articles will be provided at the end of each session. |
| Faculty or entity in charge | EPSY |

## Programmes containing this learning unit (UE)

| Program title | Acronym | Credits | Prerequisite | Learning outcomes |
|---|---|---|---|---|
| Master [120] in Psychology | PSY2M | 2 | | 🔍 |
| Master [120] in Education (shift schedule) | FOPA2M | 2 | | 🔍 |