Carl von Ossietzky Universität Oldenburg

NEUROCOGNITIVE PSYCHOLOGY

DEPARTMENT OF PSYCHOLOGY
CARL VON OSSIETZKY UNIVERSITY OLDENBURG

# Handbook of modules

for the

Research Master programme

# Neurocognitive Psychology

Date: July, 2024

**Introduction:**

The Handbook of modules lists all modules of the MSc programme *Neurocognitive Psychology*.

The research-oriented study programme lasts two years or four semesters during which a total of 120 CP must be achieved. It is composed of four parts. The general part contains five mandatory modules comprising 45 CP. The specialized part contains 10 modules from which students are free to choose at least three with a total of 24 CP. Two additional modules with a total of 12 CP ensure a recognition of a study period abroad. The programme further includes 12 CP for an external internship lasting 360 hours and 30 CP for completing the Master’s thesis with the accompanying Master’s colloquium. Another 9 CP must be acquired via a practical research project. The research components can be carried out in one of the Psychology labs at the University of Oldenburg or an external research group. The programme is designed in a modular fashion. The study structure offers increased flexibility to the students in the second half of their studies.

**Please be aware that we strongly advise to attend at least one of the five modules psy170: Neurophysiology, psy270: fMRI Data Analysis, psy220: Human Computer Interaction, psy280: Transcranial Brain Stimulation, and psy290: Ambulatory Assessment in Psychology! Knowledge of either EEG, fMRI, or TBS data analysis, or knowledge of HCI or ambulatory assessment methods is essential for most practical projects and Master’s theses offered in the Department of Psychology.**

**Work with patients or experimental data acquisition with participants generally require a very good command of German! Non-mandatory classes from clinicians are (partly) given in German. You can take German courses as your Minor.**

**Overview:**

The Master’s programme *Neurocognitive Psychology* has the following structure:

| | | |
|---|---|---|
| **General part (mandatory):** | | **45 CP** |
| psy111 / psy112 | Research methods I & II | 2x 6 CP |
| psy125 | Neuropsychological Diagnostics | 6 CP |
| psy126 | Test Theory and Test Construction | 6 CP |
| psy130 | Communication of scientific results | 6 CP |
| psy141 | Minor | 6 CP |
| psy240 | Computation in Neuroscience | 9 CP |
| **Specialized part (choose 24 CP; taking psy170, psy270, psy220, psy280 or psy290 is strongly recommended):** | | **24 CP** |
| psy150 | Clinical Psychology (partly in German) | 9 CP |
| psy170 | Neurophysiology | 6 CP |
| psy181 | Neurocognition | 6 CP |
| psy190 | Sex and Cognition | 6 CP |
| psy201 | Neuropsychology (partly in German) | 6 CP |
| psy210 | Applied Cognitive Psychology | 6 CP |
| psy220 | Human Computer Interaction | 6 CP |
| psy270 | Functional MRI Data Analysis | 9 CP |
| psy280 | Transcranial Brain Stimulation | 6 CP |
| psy285 / psy286 | Study Abroad I / II - Psychology/Neuroscience | 2x 6 CP[1] |
| psy290 | Ambulatory Assessment in Psychology | 6 CP |
| **Practical part (mandatory):** | | **51 CP** |
| psy251 | Internship or lab visit | 12 CP |
| psy260 | Practical project | 9 CP[2] |
| mam | Master’s thesis (27 CP) and Master’s colloquium (3 CP) | 30 CP |
| **Total:** | | **120 CP** |

[1] Achievements from a study abroad can be recognized in these modules if the achievements are from the field of psychology or neuroscience at Master’s level and the contents do not overlap with other elective or mandatory modules.

[2] Chose from Applied Neurocognitive Psychology, Biological Psychology, Psychological Methods and Statistics, Experimental Psychology, Neuropsychology, Ambulatory Assessment

Restriction in participant numbers apply for each elective module. There is no guarantee that students can take all modules of their choice.

# Module structure Research Master Neurocognitive Psychology (winter term 2024)

NEUROCOGNITIVE PSYCHOLOGY

## First semester

**psy111**
Research Methods I - Statistical Modeling - 1 & 2
6 CP

**psy125**
Neuropsychological Diagnostics - 1 & 2
6 CP

**psy240** Computation in Neuroscience – 1 & 2, 3 CP

**psy130**
Communication of Scientific Results – 1 & 2[1]
6 CP

**Choose from:**
**psy150** Clinical Psychology - 1, 6 CP
psy170 Neurophysiology - 1 & 2, 3 CP
**psy201** Neuropsychology - 1, 3 CP

Admission Requirement or voluntary:
Introductory Course Statistics

21 CP compulsory, max. 12 CP elective

## Second semester

**psy112**
Research Methods II - Statistical Learning - 1 & 2
6 CP

**psy126**
Test Theory and Test Construction - 1 & 2
6 CP

**psy240**
Computation in Neuroscience – 3, 4 & 5
6 CP

**Continue:**
**psy150** Clinical Psychology - 2, 3 CP
psy170 Neurophysiology - 3, 3 CP
**psy201** Neuropsychology - 2, 3 CP

**Choose from:**
**psy210** Applied Cogn. Psych. - 1, 3 CP
psy220 HCI - 1 & 2, 6 CP
psy270 fMRI Data Analysis[2], 9 CP
psy280 TBS - 1 & 2, 6 CP
psy290 Ambulat. Assess. - 1 & 2, 6 CP

18 CP compulsory, max. 39 CP elective

## Semester break

*Mobility window for*

**psy251**
Internship
12 CP

*12 CP = 360h, may be split, e.g., 150h + 210h or 180h + 180h; At least 210h to be performed externally. Should be planned to start in the third week after the lecture period ends, in order to not collide with exams.*

12 CP compulsory

## Third semester

**psy141**
Minor[3]
6 CP *(or 2x 3CP)*

**psy260**
Practical Project[4]
9 CP

**Continue:**
**psy150** Clinical Psychology - 1, 6 CP *(if not studied in 1st sem.)*
**psy210** Applied Cognitive Psychology - 2, 3 CP

**Choose from:**
**psy181** Neurocognition - 1, 3 CP
**psy190** Sex and Cognition - 1 & 2, 6 CP

*Optional mobility window to study abroad:* Elective modules for recognition **psy285/psy286** Study Abroad - Psychology/Neuroscience, 2x 6 CP

15 CP compulsory, max. 18 CP elective

## Fourth semester

**mam**
Master's Thesis and Colloquium
30 CP

**Continue:**
**psy181** Neurocognition - 2, 3 CP

30 CP compulsory., max. 3 CP elective

**General** part: Compulsory modules, 45 CP in total
**Practical** part: Research modules & Internship, 51 CP in total
**Specialized** part: Electives & methods, choose 24 CP in total[5]

120 CP in four semesters

This plan is a suggestion how to arrange your modules. You are free to study the modules or parts of the modules earlier or later than suggested. You should aim to study 30 +/- 3 credit points per semester. 1 CP equals to 30 hours of work including preparation outside class.

1: psy130 part 2 can be taken during winter and/or summer term.
2: psy270 is blocked over 7 weeks in the first half of the term.
3: psy141: Choose Master classes of your interest, inside or outside the Department of Psychology. German or academic writing classes are possible.
4: psy260: Prior completion of psy240 required. Plan for a workload of ~20h/week for 3 months.
5: A combination of more than 24 CP would be reduced to 24 CP to calculate the grade. Choose at least 1 method course (highlighted in green).
***For further information, check the module descriptions in the module handbook!***

## Learning outcomes and competencies Research Master Neurocognitive Psychology

| valid from study year 2023/24 | | | skills / competencies | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | expert neuropsychological / neurophysiological knowledge | interdisciplinary kowledge & thinking | experimental methods | statistics & scientific programming | data presentation & discussion | independent research | scientific literature | scientific English / writing | ethical evaluation / good scientific practice / professional behaviour | critical & analytical thinking | scientific communication skills | knowledge transfer | group work | project & time management |
| modules (mandatory / elective) | psy111 | Research Methods - Statistical Modeling | | ++ | | ++ | ++ | + | + | | ++ | ++ | ++ | | + | |
| | psy112 | Research Methods - Statistical Learning | | ++ | | ++ | ++ | + | + | | ++ | ++ | ++ | | + | |
| | psy125 | Neuropsychological Diagnostics | + | + | | | | | | | + | + | | | | |
| | psy126 | Test Theory and Test Construction | | + | | | | | | | + | + | | | | |
| | psy130 | Comminucation of Scientific Results | | | | | ++ | | ++ | ++ | | | ++ | | + | |
| | psy141 | Minor | | ++ | | | | | | | | | | | | |
| | psy150 | Clinical Psychology | ++ | | + | | + | | + | | | + | | + | + | |
| | psy170 | Neurophysiology | ++ | | ++ | ++ | | | | | ++ | | | | + | + |
| | psy181 | Neurocognition | ++ | ++ | | | ++ | | ++ | | | | + | | + | |
| | psy190 | Sex and Cognition | ++ | + | | | ++ | | ++ | | | + | ++ | | + | + |
| | psy201 | Neuropsychology | ++ | + | ++ | | + | | ++ | | | + | + | | | |
| | psy210 | Applied Cognitive Psychology | ++ | + | + | | | | + | | + | + | + | + | | |
| | psy220 | Human Computer Interaction | ++ | ++ | + | ++ | | | | | | + | + | + | + | + |
| | psy240 | Computation in Neuroscience | + | | + | ++ | | | | | | + | | + | + | |
| | psy251 | Internship | ++ | + | + | | | | | | ++ | | | ++ | | + |
| | psy260 | Practical Project | | | ++ | + | ++ | + | + | | + | | + | + | + | ++ |
| | psy270 | Funtional MRI Data Analysis | | | ++ | ++ | + | | | | | | | | ++ | |
| | psy280 | Transcranial Brain Stimulation | ++ | | ++ | + | | | + | | + | | | | | |
| | psy285/286 | Study Abroad - Psychology/Neuroscience | depends on the chosen module | | | | | | | | | | | | | |
| | psy290 | Ambulatory Assessment | ++ | + | ++ | ++ | | | | | + | + | | | | + |
| | Mam | Master's thesis | | | ++ | + | + | ++ | + | ++ | + | + | + | + | | ++ |

# Mastermodule

## psy111 - Research methods I - Statistical Modeling

| | |
|---|---|
| **Module label** | Research methods I - Statistical Modeling |
| **Modulkürzel** | psy111 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Hildebrandt, Andrea (module responsibility)<br>• Hildebrandt, Andrea (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | Goals of module:<br>After completion of this module, students will have basic knowledge in managing and understanding quantitative data and conducting a wide variety of multivariate statistical analyses. They can apply the statistical methodology in terms of good scientific practice and interpret, evaluate and synthesize empirical results in basic and applied research contexts. Students will be aware of statistical misconceptions and they can overcome them.<br><br>**Competencies:**<br>++ interdisciplinary kowledge & thinking<br>++ statistics & scientific programming<br>++ data presentation & discussion<br>+ independent research<br>+ scientific literature<br>++ ethics / good scientific practice / professional behavior<br>++ critical & analytical thinking<br>++ scientific communication skills<br>+ group work |
| **Module contents** | **Part 1: Multivariate statistical modeling**<br><br>• Graphical representation of multivariate data<br>• The Generalized Linear Modeling (GLM) framework<br>• Multiple and moderated linear regression with quantitative and qualitative predictors<br>• Logistic regression models<br>• Multilevel regression (Generalized Linear Mixed Effects Modeling – GLMM)<br>• Non-linear regression models (Polynomial regression, regression splines and local regression)<br>• Path modeling<br>• Factor analysis (exploratory & confirmatory)<br>• Structural equation modeling (SEM; linear and non-linear)<br><br>**Part 2: Multivariate statistical modeling with R (hands-on seminar)**<br><br>• Data examples and applications of GLM, GLMM, polynomial, spline and local regression, path modeling, factor analyses and SEM |
| **Literaturempfehlungen** | |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will start every winter term. |

| | |
|---|---|
| **Module capacity** | unlimited |
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Parts 1: lecture; Parts 2: seminar; additional tutorials are offered. |
| **Previous knowledge** | Solid knowledge in basic statistics; otherwise please attend Introductory Course Statistics |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | |
| | end of winter term | The module will be tested with a written exam.<br><br>Required active participation for gaining credits: attendance of at least 70% in the seminar within one semester (will be checked in StudIP) |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | WiSe | 28 |
| Seminar | | 2 | WiSe | 28 |
| Tutorial | statistics | | WiSe | 0 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy112 - Research methods II - Statistical Learning

| | |
|---|---|
| **Module label** | Research methods II - Statistical Learning |
| **Modulkürzel** | psy112 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Hildebrandt, Andrea (module responsibility)<br>• Hildebrandt, Andrea (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | Goals of module:<br>Building upon the basic knowledge in multivariate statistical modeling covered in psy111, after completion of this module students will know how to deal with big data to address empirical questions in neurocognitive psychology. They will be able to solve prediction and classification problems to the realm of basic and applied statistical/machine learning purposes. Furthermore, students will understand the specifics of applied research and the statistical modeling of noisy, longitudinal data.<br><br>**Competencies:**<br>++ interdisciplinary kowledge & thinking<br>++ statistics & scientific programming<br>++ data presentation & discussion<br>+ independent research<br>+ scientific literature<br>++ ethics / good scientific practice / professional behavior<br>++ critical & analytical thinking<br>++ scientific communication skills<br>+ group work |
| **Module contents** | **Part 1: Statistical / machine learning methods**<br><br>• Supervised and unsupervised statistical learning and prediction<br>• Resampling methods<br>• Regularized regression<br>• Linear and quadatic discriminant analysis<br>• Naive Bayes algorithm<br>• Tree-based methods<br>• Support vector machines<br>• The basics of neural networks<br>• Principal component regression<br>• Clustering methods<br><br>**Part 2: Statistical / machine learning methods with R (voluntary hands-on seminar)**<br><br>• Data examples and applications of the basic machine learning methods covered in the lecture<br><br>**Part 3: Evaluation research (seminar with theory and practice)**<br><br>• Paradigms and methods in applied evaluation research (quantitative, mixed-methods)<br>• Types of studies and designs in evaluation research (experimental, quasi-experimental, (multiple) time series, etc.)<br>• Multivariate statistical modeling of change over time and group differences in change<br>• Specific statistical tools for sampling and matching (e.g., Propensity score matching)<br>• Basics of causality theory and the estimation of average and conditional |

effects in EffectLiteR
- Research synthesis and meta-analysis

| | |
|---|---|
| **Literaturempfehlungen** | |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will start every summer term. |
| **Module capacity** | unlimited |
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture; Parts 2 and 3: seminars; additional tutorials are offered. |
| **Previous knowledge** | psy 111 Research methods I – Statistical Modeling |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | |
| | end of summer term | The module will be tested with an oral exam (25 min).<br><br>Required active participation for gaining credits: attendance of at least 70% in the mandatory seminar within one semester (will be checked in StudIP) |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | SoSe | 28 |
| Seminar | R seminar voluntary | 2 | SoSe | 28 |
| Tutorial | statistics | | SoSe | 0 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy125 - Neuropsychological Diagnostics

| | |
|---|---|
| **Module label** | Neuropsychological Diagnostics |
| **Modulkürzel** | psy125 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Roheger, Mandy (module responsibility)<br>• Roheger, Mandy (Prüfungsberechtigt)<br>• Hildebrandt, Andrea (Prüfungsberechtigt)<br>• Kranczioch-Debener, Cornelia (Prüfungsberechtigt)<br>• Debener, Stefan (Prüfungsberechtigt)<br>• Kiene, Franziska (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will acquire specific knowledge about (neuro-)psychological assessment and will be trained to utilize this knowledge within a research context and in applied settings. Students will learn how to analyze clinical cases (“case conceptualization”), how to plan and conduct the information assessment phase, how to record and summarize collected data and how to integrate information in order to draw conclusions about the case given specific diagnostic strategies. Finally, students will learn about the requirements of assessment report generation in written an oral form given a specific applied context. Ethical guidelines and quality norms will be an implicit topic in all courses in the module.<br><br>**Competencies:**<br>+ Neuropsychological / neurophysiological knowledge for clinical assessments<br>+ interdisciplinary knowledge & thinking<br>+ ethics / good scientific practice / professional behavior<br>+ critical & analytical thinking |
| **Module contents** | **Part 1: Introduction to neuropsychological diagnostics (lecture): winter**<br><br>• Psychological assessment as a decision process – descriptive and prescriptive models<br>• Assessment methods, their construction and design, quality criteria<br>• The logic of decision making in the assessment process<br>• Classificatory decisions<br>• Psychometrics to single cases<br>• Examples of diagnostics processes in different clinical populations<br>• Focus areas on different cognitive domains, their underlying models, respective possible impairments and possibilities for neuropsychological assessment<br>• Reasoning for the applications of neuropsychological tests<br>• Summarizing results and writing reports<br><br>**Part 2: Applied Neuropsychological Diagnostics (seminar): winter**<br><br>• Case conceptualization (neuropsychology and clinical psychology)<br>• Formulating hypotheses<br>• Selecting assessment procedures and planning administration<br>• specific knowledge on neuropsychological testing<br>• exercises in neuropsychological testing / practicing tests<br>• Evaluating the application of assessment procedures<br>• Analyzing, summarizing and visualizing results<br>• Integrating results based on the decision rules<br>• Writing a psychological/assessment report |
| **Literaturempfehlungen** | Will be specified in the courses. |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will start every winter term. |
| **Module capacity** | unlimited |

| | |
|---|---|
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture; Part 2: seminar |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | Parts of the practical exercise need to be completed and handed in at specific dates during winter term. | The module will be tested by a practical exercise: assessment report. The report can be written in English or German.<br><br>Required active participation for gaining credits: attendance of at least 70% in the seminar within one semester. |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | SoSe oder WiSe | 0 |
| Seminar | | 2 | SoSe oder WiSe | 0 |
| **Präsenzzeit Modul insgesamt** | | | | 0 h |

## psy126 - Test Theory and Test Construction

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|---|---|
| **Module label** | Test Theory and Test Construction |
| **Modulkürzel** | psy126 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Hildebrandt, Andrea (module responsibility)<br>• Hildebrandt, Andrea (Prüfungsberechtigt)<br>• Hellmann, Andreas (Prüfungsberechtigt)<br>• Debener, Stefan (Module counselling) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | Goals of module:<br>Students will acquire specific knowledge of modern test theory and test construction and will be trained to apply this knowledge in the context of test development and test adaptation. They will reflect on the differences between traditional and modern test theory and their use in the domain of applied psychometrics and the systematic design of interview and observation methods. Finally, students will learn about the requirements for writing test construction and/or adaptation reports. Ethical guidelines in psychometrics and quality standards will be implicit topics throughout the module.<br><br>**Competencies:**<br>+ research methods and psychometric knowledge<br>+ interdisciplinary kowledge & thinking<br>+ ethics / good scientific practice / professional behavior<br>+ critical & analytical thinking |
| **Module contents** | **Part 1: Test Theory and Test Construction (lecture): summer**<br><br>• Classical test theory<br>• Generalizability theory<br>• Latent-State and Trait theory<br>• Latent variable models for different types of item responses<br>• Measurement invariance across groups and time<br>• Network modeling and machine learning in psychometrics<br>• Preference modeling for constructing faking-resistant questionnaires and tests<br><br>**Part 2: Test Analysis Applied (hands-on seminar): summer**<br><br>• Test adaptation conceptualization<br>• Test data processing<br>• Item mining and analysis<br>• Test analysis report writing |
| **Literaturempfehlungen** | Will be specified in the courses. |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will start every summer term. |
| **Module capacity** | unlimited |

| | |
|---|---|
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture; Part 2: seminar |
| **Previous knowledge** | You should know basic statistical concepts and multivariate statistics as they are covered in the introductory course statistics and in Research Methods I. |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | |
| | Parts of the practical exam need to be completed and handed in at specific dates during the summer term. | The module will be tested by a portfolio: test adaptation report of 5 pages text + figures + script<br><br>Required active participation for gaining credits: attendance of at least 70% in the seminar within one semester. |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | SoSe oder WiSe | 0 |
| Seminar | | 2 | SoSe oder WiSe | 0 |
| **Präsenzzeit Modul insgesamt** | | | | 0 h |

## psy130 - Communication of scientific results

| | |
|---|---|
| **Module label** | Communication of scientific results |
| **Modulkürzel** | psy130 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Herrmann, Christoph Siegfried (module responsibility)<br>• Herrmann, Christoph Siegfried (Prüfungsberechtigt)<br>• Strüber, Daniel (Prüfungsberechtigt)<br>• Roheger, Mandy (Prüfungsberechtigt)<br>• Mahadevan, Rachana (Prüfungsberechtigt)<br>• Strüber, Daniel (Module counselling) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will acquire specific knowledge about the presentation of scientific results both orally<br>and in writing. Students will learn modern techniques for presentation, literature research and<br>writing skills. They will also be taught about arguing scientifically.<br><br>**Competencies:**<br>++ data presentation & discussion<br>++ scientific literature<br>++ scientific English / writing<br>++ scientific communication skills<br>+ group work |
| **Module contents** | **Part 1: Communication of scientific results (seminar)**<br>Literature search<br>Presentation skills<br>Writing skills<br><br>**Part 2: Psychological colloquium**<br>Experienced scientists from various psychological disciplines will be giving talks about their<br>experimental results. Speakers will be invited also from other universities. Students are<br>encouraged to discuss the results with the experts and to make suggestions on whom to invite |
| **Literaturempfehlungen** | - Sternberg, Robert (2000) Guide to Publishing in Psychology Journals, Cambridge University Press |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1-2 Semester |
| **Module frequency** | Part 1 will be offered every winter term. Part 2 will be offered every semester. |
| **Module capacity** | unlimited |
| **Reference text** | Students can chose whether they want to attend the colloquium in the first, second or both semesters. |
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | during winter term | Oral presentation<br><br>Required active participation for gaining credits:<br>70% attendance of the seminar within one semester and<br>at least 8 colloquia within two semesters (will be |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| | | checked in StudIP) and active discussion in at least 1 colloqium. |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Seminar | | 2 | WiSe | 28 |
| Colloquium | | 2 | SoSe und WiSe | 28 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy141 - Minor

| | |
|---|---|
| **Module label** | Minor |
| **Modulkürzel** | psy141 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Rieger, Jochem (Module counselling)<br>• Bleichner, Kerstin (Module counselling)<br>• Rieger, Jochem (Prüfungsberechtigt)<br>• Gießing, Carsten (Prüfungsberechtigt)<br>• Puschmann, Sebastian (Prüfungsberechtigt)<br>• Spiegler, Andreas (Prüfungsberechtigt)<br>• Maier, Esther Christine (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will gain an overview of non-psychological topics related to cognitive neuroscience and neuropsychology. They will see how psychological theories apply in other fields. Students can strengthen their own professional profile. Students may also broaden their psychological knowledge or language skills.<br><br>**Competencies:** |
| **Module contents** | To complement the core of the study programme in a meaningful way, students can take Master modules and courses from the fields<br><br>• Biology<br>• Neurosciences<br>• Computer Science<br>• Physics<br>• Mathematics<br>• Pedagogy<br>• Philosophy<br>• related fields<br>• Psychology (additional elective module (NOT psy170, psy220, psy270, psy280, psy290) or from another study programme)<br><br>Students whose first language is not German, may take German classes.<br><br>Upon approval, German-speaking students can attend a career-relevant language course (i.e. necessary for internship, practical project or Master's thesis).<br><br>Students can take the academic writing course ‘English for University Studies: 5. Writing and Reading pb337’ from the language center. Other English classes cannot be taken as Minor.<br><br>A list of already approved courses/modules can be found on our website.<br><br>You can take other courses/modules if they fulfil the following requirements:<br><br>• Master level (other than language courses)<br>• may be ungraded, but need proof of competence (e.g. a pass/fail exam)<br><br>Note that Minor courses/modules must not repeat contents of mandatory modules or taken elective modules of the programme.<br><br>**We recommend taking modules/courses that strengthen your own professional profile.** |
| **Literaturempfehlungen** | |
| **Links** | List of approved courses/modules and approval form:<br>https://uol.de/en/psychology/master/course-overview/ |

| | |
|---|---|
| | -> Supporting documents |
| **Languages of instruction** | English , German |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | irregular |
| **Module capacity** | unlimited |
| **Reference text** | PLEASE NOTE:<br><br>If you want to take a module/course which is not listed in the list of approved courses/modules, please check thoroughly whether the course/module fulfils the requirements listed under 'module contents' before you start the course/module. The requirements for the minor module are also described in the subject specific amendments to the general examination regulations (fachspez. Anlage).<br><br>In cases of doubt, the programme coordinator can advise you.<br><br>Recognition procedure:<br><br>• Certificates of completion of approved courses/modules (see list of approved courses) have to be sent directly to the examinations office.<br>• Certificates of completion for courses/modules without former approval have to be sent to the head of the examinations committee together with the approval form and a course/module description.<br><br>If you want to take an additional elective module for your Minor (taking only a part of an elective module is not possible), you need to inform the contact person for the respective module in writing BEFORE the start of the module. If your request is NOT rejected in written form within 4 weeks, the module counts as approved for the Minor and the course credits will be automatically entered for your Minor. You will receive a pass/fail for this module. You CANNOT use it afterwards as a normal elective module. You can also NOT rededicate an elective that you have already started as your Minor.<br><br>Bachelor level courses are NOT acceptable. Note that Bachelor level courses can be listed in some Master programmes (e.g. Master of Education). This does not qualify a Bachelor level course for the Minor module.<br><br>It is your responsibility to ask the teacher whether you can take part in a course/module.<br><br>**Please be aware that you can only use 6 credits for the module psy141 Minor. If you take more Minor courses/modules, these credits cannot be used for your degree. You can still ask the teacher to sign an attendance certificate (download https://uol.de/en/psychology/master/course-overview) or module examination form (https://uol.de/en/course-of-study/exams/neurocognitive-psychology-master-545) which is sufficient for later applications to prove that you took the additional course/module.** |
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Lectures and seminars (depends on the chosen modules) |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | If grades are earned in the minor, those are counted as pass/fail. Certificates for grades can be separately requested from the examination office. |

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| **Form of instruction** | VA-Auswahl |
| **SWS** | 4 |
| **Frequency** | SoSe oder WiSe |
| **Workload Präsenzzeit** | 56 h |

## psy150 - Clinical Psychology

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|---|---|
| **Module label** | Clinical Psychology |
| **Modulkürzel** | psy150 |
| **Credit points** | 9.0 KP |
| **Workload** | 270 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Thiel, Christiane Margarete (module responsibility)<br>• Thiel, Christiane Margarete (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of the Module:**<br>Students acquire scientifically sound, critical thinking regarding the genesis and psychopharmacological treatment of various mental illnesses; decision making based on the<br>medical guidelines and evidence-based practice.<br><br>**Competencies:**<br>++ Neuropsychological / neurophysiological knowledge<br>+ experimental methods<br>+ data presentation & discussion<br>+ scientific literature<br>+ critical & analytical thinking<br>+ knowledge transfer<br>+ group work |
| **Module contents** | The first part of the module provides students with a theoretical and practical background on<br>neurobiological and neurochemical bases of psychiatric disorders and pharmacological<br>interventions. This will be complemented by psychiatric interviews in simulated patients<br>focussing on psychopathological assessment. In the second part, the students will learn to plan<br>and assess the effectiveness of psychological interventions for selected disorders.<br><br>**Part 1: Neurobiological basis of psychiatric disorders and pharmacological intervention**<br>**(lecture and seminar): winter**<br>Basics of neurotransmitter systems and psychopharmacology<br>Substance Abuse (e.g. psychostimulants, hallucinogenics)<br>Depression<br>Anxiety Disorders<br>Alzheimer's Disease<br>Schizophrenia<br>psychopathological assessment<br><br>The seminar (voluntary) will be given in German as clinicians and patient actors are involved.<br>**Part 2: Psychological interventions within the framework of evidence-based medicine**<br>**(3 seminars to chose from, one partly in German): summer**<br>The seminars focus on concepts of evidence based treatment:<br>- with application to acquired dysfunctions of the brain (2.1)<br>- to selected psychiatric disorders (2.2)<br>- with application to trauma- and stress-related psychiatric disorders. Special emphasis is placed on children and adolescents (2.3)<br><br>Options:<br>1. Students attend both parts 2.1 and 2.2<br>2. Students attend the first four classes of 2.1 in addition to part 2.3 |

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| | For summer term 2025, the seminars will most likely be restructured. |
| **Literaturempfehlungen** | |
| | • Meyer, J.S. & Qenzer, L.F. (2018) Psychopharmacology: Drugs, the Brain and<br>Behaviour. Sunderland, MA: Sinauer Associates. (part 1)<br>• Kring, A.M, Johnson, S.L., Davison, G.C., & Neale, J.M., (2012) Abnormal Psychology.<br>John Wiley & Sons (12th ed) (introductory literature)<br>• Selected papers (part 2) |
| **Links** | |
| **Languages of instruction** | English , German |
| **Duration (semesters)** | 2 Semester |
| **Module frequency** | Part 1 will be offered every winter term, part 2 every summer term. |
| **Module capacity** | unlimited |
| **Reference text** | |
| | Please note:<br>Parts of this module that teach clinical contents will be taught in German (partly with accompanying English materials). All mandatory parts are taught in English. German knowledge is not necessary to successfully complete the module. |
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture and seminar: part 2: seminar |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | |
| | mid-February | The module will be tested with a written exam (2 h) on the contents of the lecture in part 1.<br><br>Required active participation for gaining credits:<br>1 presentation (or if no presentation is offered in the seminar: reading and discussion of papers)<br>participation in discussions on other presentations<br>attendance of at least 70% in both seminars in part 2 within one semester (will be checked in StudIP). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | WiSe | 28 |
| Seminar | | 4 | SoSe und WiSe | 56 |
| **Präsenzzeit Modul insgesamt** | | | | 84 h |

## psy170 - Neurophysiology

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|---|---|
| **Module label** | Neurophysiology |
| **Modulkürzel** | psy170 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Debener, Stefan (module responsibility)<br>• Debener, Stefan (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will understand the basic concepts of biomedical signal processing. They will use EEG<br>analysis tools interactively and independently and will understand the complete chain of EEG<br>analysis steps, from data import to the illustration of results. They will be able to use open<br>source tools for EEG analysis and apply theoretical knowledge to practical problems of<br>physiology.<br><br>**Competencies:**<br>++ Neuropsychological / neurophysiological knowledge<br>++ experimental methods<br>++ statistics & scientific programming<br>++ ethics / good scientific practice / professional behavior<br>+ group work<br>+ project & time management |
| **Module contents** | Students will acquire specific knowledge about neurophysiology and neuroanatomy, learn the<br>fundamental concepts of multi-channel EEG analysis, and acquire hands-on skills in recording EEG data and using EEGLAB, an open-source software toolbox for advanced EEG analysis.<br><br>**Part 1: Neurophysiology and neuroanatomy (lecture): winter**<br>Neurophysiology, EEG, EMG, ECG<br>Neuroanatomy<br>Time-domain and frequency-domain analysis methods<br><br>**Part 2: EEG recording and analysis (hands-on seminar): winter**<br>In small groups under supervision of the lecturer, all students will record EEG data of their fellow students and will serve as participants for their classmates. We cannot guarantee same-gender groups.<br>Recording and analysis of biomedical signals<br>Averaging, filtering, signal-to-noise<br>Topographical EEG analysis<br><br>**Part 3: EEG analysis with Matlab (hands-on seminar): summer**<br>EEGLAB file I/O, data structure and scripting<br>Preprocessing, artefact rejection and artefact correction<br>Statistical decomposition<br>Event-related potentials, topographical mapping and power spectra<br>Illustration of results<br>Literatur |
| **Literaturempfehlungen** | • Kandel et al. (2000). Principles of Neural Science, McGraw-Hill |

- Luck, S.J. (2005). An Introduction to the ERP Technique, The MIT Press
- Van Drongelen, W. (2006). Signal Processing for Neuroscientists, Academic Press

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| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 2 Semester |
| **Module frequency** | The module will start every winter term. |
| **Module capacity** | 18 (<br><br>The lecture is not restricted.<br><br>) |
| **Reference text** | PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy280, psy220 or psy290 to gain methodological competencies (EEG, fMRI, TBS, HCI, ambulatory assessment techniques) that are needed for most practical projects and Master's theses! |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture; Part 2 and 3: seminars |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | |
| | exam period at the end of the summer term | The module will be tested with a written exam of 2 h duration.<br><br>Required active participation for gaining credits: recording of electroencephalographic data of fellow students and serving as participant for classmates attendance of at least 70% in each seminar within one semester (will be checked in StudIP). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | 2 semester hours per week in first half of the winter term. | 1 | WiSe | 14 |
| Seminar | 2 semester hours per week in second half of the winter term.<br>2 semester hours per week in summer term. | 3 | SoSe und WiSe | 42 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy181 - Neurocognition

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|---|---|
| **Module label** | Neurocognition |
| **Modulkürzel** | psy181 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Thiel, Christiane Margarete (module responsibility)<br>• Thiel, Christiane Margarete (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students should be able to recognize and critically evaluate the value of considering<br>neuroscience in the study of psychological topics.<br><br>**Competencies:**<br>++ neuropsychological / neurophysiological knowledge<br>++ interdisciplinary kowledge & thinking<br>++ data presentation & discussion<br>++ scientific literature<br>+ scientific communication skills<br>+ group work |
| **Module contents** | Students will first acquire a general understanding of the brain mechanisms of different cognitive<br>functions and the methods used to study these functions. They will then apply this knowledge by<br>discussing current research topics (part 1). Knowledge will be transferred to the relation<br>between the development of the human brain and the cognitive processes it supports (part 2).<br><br>**Part 1: Introduction to cognitive neuroscience (lecture and seminar): winter**<br>Brain and cognition, methods of cognitive neuroscience<br>Attention, learning and memory<br>Emotional and social behaviour<br>Language, executive functions<br><br>**Part 2: Neurocognitive development (seminar): summer**<br>Brain development and cortical plasticity<br>Effects of early-life stress on brain development<br>Development of object recognition, social cognition, memory, and executive functions |
| **Literaturempfehlungen** | • Ward (2019) The Student's Guide to Cognitive Neuroscience, Psychology Press<br>• Nelson, Haan & Thomas (2006) Neuroscience of Cognitive Development: The Role of Experience and the Developing Brain, Wiley & Sons<br>• Johnson (2011) Developmental Cognitive Neuroscience, 3rd ed., Wiley-Blackwell. |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 2 Semester |

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| **Module frequency** | Part 1 will be offered every winter term, part 2 every summer term. |
| **Module capacity** | 20 (<br>Part 1 (lecture and seminar) are unrestricted, part 2 is restricted to 20 students.<br>) |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture and seminar; Part 2: seminar |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | mid-February | The module will be tested with a written exam of 2 h duration on the contents of part 1.<br><br>Required active participation for gaining credits:<br>1 presentation participation in discussions on other presentations<br>attendance of at least 70% in both seminars within one semester (will be checked in StudIP). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 1 | WiSe | 14 |
| Seminar | | 3 | SoSe und WiSe | 42 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy190 - Sex and Cognition

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|---|---|
| **Module label** | Sex and Cognition |
| **Modulkürzel** | psy190 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Strüber, Daniel (module responsibility)<br>• Strüber, Daniel (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will acquire specific knowledge about sex differences in cognitive abilities and social<br>behaviours. They will be able to understand the interrelated impact of social and biological<br>influences on the brain's control of the (sex-specific) behaviours. Students should be able to<br>critically evaluate behavioural sex differences from different perspectives and to reflect on<br>possible implications for society.<br><br>**Competencies:**<br>++ neuropsychological / neurophysiological knowledge<br>+ interdisciplinary kowledge & thinking<br>++ data presentation & discussion<br>++ scientific literature<br>+ critical & analytical thinking<br>++ scientific communication skills<br>+ group work<br>+ project & time management |
| **Module contents** | Inhalte<br><br>**Part 1: Introduction to the study of sex differences (lecture): winter**<br>The measurement of sex differences<br>Sex differences in emotion<br>Sex differences in aggression<br>Sex differences in cognitive abilities<br>Hormones, sexual differentiation, and gender identity<br>Sex hormones and play preferences<br>Sex differences in hemispheric organization<br>Brain size and intelligence<br><br>**Part 2: Sex, brain, and behaviour (seminar): winter**<br>Sex differences in empathy<br>The extreme male brain theory of autism (S. Baron-Cohen)<br>Sex differences in neuropsychiatric disorders<br>Sex differences in stress response<br>Social implications of sex differences |
| **Literaturempfehlungen** | • Diane F. Halpern (2000) Sex Differences in Cognitive Abilities, Lawrence Erlbaum Associates<br>• Doreen Kimura (2000) Sex and Cognition, MIT Press<br>• Melissa Hines (2004) Brain Gender, Oxford University Press<br>• Richard A. Lippa (2005) Gender, Nature, and Nurture, Lawrence Erlbaum Associates |

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| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will be offered every winter term. |
| **Module capacity** | 30 |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture; Part 2: seminar |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | during winter term | oral presentation<br><br>Required active participation for gaining credits: participation in discussions on other presentations attendance of at least 70% in the seminar within one semester (will be checked in StudIP). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | WiSe | 28 |
| Seminar | | 2 | WiSe | 28 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy201 - Neuropsychology

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|---|---|
| **Module label** | Neuropsychology |
| **Modulkürzel** | psy201 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Debener, Stefan (module responsibility)<br>• Debener, Stefan (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will learn to understand changes in thinking and behaviour that may arise from brain<br>dysfunctions (part 1, 3), acquire specific knowledge on cognitive rehabilitation (part 2), and learn<br>to understand, communicate and evaluate progress in clinical practice and experimental<br>research in neuropsychology (part 3).<br><br>**Competencies:**<br>++ neuropsychological / neurophysiological knowledge<br>+ interdisciplinary kowledge & thinking<br>++ experimental methods<br>+ data presentation & discussion<br>++ scientific literature<br>+ critical & analytical thinking<br>+ scientific communication skills |
| **Module contents** | **Part 1: Introduction to Clinical Neuropsychology (lecture): winter**<br>Cortical lobes (anatomy, functions, lesion symptoms, neuropsychological tests)<br>Higher functions (learning & memory, language, emotion, spatial behavior attention)<br>Plasticity and disorders (development, learning and reading disabilities, recovery)<br><br>**Part 2: Cognitive Neurorehabilitation (seminar): summer**<br>Behavioural and neuropsychological approaches<br>neurofeedback in neurorehabilitation and ADHD<br>memory rehabilitation<br>effects of physical activity on cognition<br>motor recovery<br><br>**Part 3: Topics in Clinical Neuropsychology (seminar; taught partly in German): winter winter (will NOT be offered in winter term 2024/2025!)**<br>Clinical neuroanatomy<br>Neurodegenerative diseases<br>Dementia<br><br>Choose either part 2 or part 3! |
| **Literaturempfehlungen** | |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1-2 Semester |
| **Module frequency** | The module will start every winter term. |
| **Module capacity** | 30 ( |

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| | Part 3 is not restricted.<br><br>) |
| **Reference text** | Part 1 (lecture) is mandatory. Choose either part 2 or part 3 (seminars).<br>Note: The lecture of part 3 is given in German with accompanying English materials. Students who cannot follow a lecture in German are given priority in part 2. |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture; Part 2: seminar; Part 3: seminar |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | |
| | exam period at the end of winter term | The module will be tested with a written exam of 2 h duration.<br><br>Required active participation for gaining credits:<br>presentation<br>participation in discussions on other presentations<br>attendance of at least 70% in one seminar within one semester (will be checked in StudIP). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | WiSe | 28 |
| Seminar | | 2 | SoSe oder WiSe | 28 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy210 - Applied Cognitive Psychology

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|---|---|
| **Module label** | Applied Cognitive Psychology |
| **Modulkürzel** | psy210 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Rieger, Jochem (module responsibility)<br>• Rieger, Jochem (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request. |
| **Skills to be acquired in this module** | **Goals of the module:**<br>Students will gain an overview of theories of (Neuro)Cognitive Psychology with potential for<br>application. On completion of this module students should have a repertoire of cognitive<br>psychology concepts relevant for real world situations, be able to transfer the learned theoretical<br>concepts into practical contexts and evaluate potential issues arising in the process of<br>translation.<br><br>**Competencies:**<br>++ Neuropsychological / neurophysiological knowledge<br>+ interdisciplinary kowledge & thinking<br>+ experimental methods<br>+ scientific literature<br>+ ethics / good scientific practice / professional behavior<br>+ critical & analytical thinking<br>+ scientific communication skills<br>+ knowledge transfer |
| **Module contents** | The module will cover core concepts of cognitive psychology, their neuronal basis, basic<br>knowledge of neuroimaging and data analysis techniques. Special emphasis will be put on<br>research aiming at complex real-world settings and translation of basic science in to practice.<br>Examples of successful transfers will be analyzed. The lecture provides the theoretical basis. In<br>the seminar the material is consolidated by examples from the literature which will be presented,<br>critically analyzed and discussed.<br><br>**Part 1: (Neuro)Cognitive Psychology in the wild I (lecture): summer**<br><br>• Neurocognitive Psychology with emphasis in real world context<br>• Methodological considerations: Generalization, validity of theories and research methods<br>• Information uptake and representation: Sensation, perception, categorization<br>• Selection of information and capacity: Attention and memory enhancement and failure<br>• Generation and communication: Language, reading, dyslexia<br>• Pursuing goals: Thinking, problem solving and acting<br><br>**Part 2: (Neuro)Cognitive Psychology in the wild II (seminar): winter**<br>In the accompanying seminar we will work through recent examples in the literature for topics of<br>the lecture. The goal is to apply novel knowledge from the lecture to understand and critically<br>discuss actual research approaches. |
| **Literaturempfehlungen** | • Esgate, A. (2004) An Introduction to Applied Cognitive Psychology, |

Psychology Press
- Sternberg, RJ and Sternberg, K. (2011) Cognitive Psychology, Wadsworth
- Ward (2010) The Student's Guide to Cognitive Neuroscience, Psychology Press

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|---|---|
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 2 Semester |
| **Module frequency** | Part 1 will be offered every summer term, part 2 every winter term. |
| **Module capacity** | 30 |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS) |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | last class in summer term | The module will be evaluated with a written exam of 2 hours duration.<br><br>Required active participation for gaining credits:<br>1-2 presentations<br>participation in discussions on other presentations<br>attendance of at least 70% in the seminar within one semester (will be checked in StudIP). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | SoSe | 28 |
| Seminar | | 2 | SoSe | 28 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy220 - Human Computer Interaction

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|---|---|
| **Module label** | Human Computer Interaction |
| **Modulkürzel** | psy220 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Rieger, Jochem (module responsibility)<br>• Rieger, Jochem (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology or other programs related to the field (e.g. neuroscience, computer science, physics etc.). |
| **Skills to be acquired in this module** | **Goals of module:**<br>The goal of the module is to provide students with basic skills required to plan, implement and<br>evaluate brain computer interfaces as devices for human computer interaction. BCIs are an<br>ideal showcase as they fully span the interdisciplinary field of HCI design, implementation and<br>evaluation. Importantly, classical BCI-methods can be used for modern data-driven basic neuroscience.<br>The module is designed as an "enabler course", meaning that ideally students should be able to understand and start independent studies into the BCI-methods. Therefore, it goes into depth instead of breadth. Good programming skills and some active knowledge of high school maths is strongly advised to maximize the learning outcome.<br><br>**Competencies:**<br>++ understanding of the foundations of statistical learning techniques<br>+ basics to understand technical time series processing and machine learning papers<br>++ interdisciplinary knowledge & thinking<br>+ experimental methods<br>++ statistics & scientific programming<br>+ critical & analytical thinking<br>+ scientific communication skills<br>+ knowledge transfer<br>+ group work<br>+ project & time management |
| **Module contents** | The module will introduce classic BCI paradigms and brain recoding techniques. However the main focus will be on a deeper understanding of the most important signal processing, machine learning, and performance evaluation techniques. The module combines a lecture on the theoretical foundations a seminar/hands on course in which students learn to implement the BCI-processing steps on real neurophysiological data and further elaborate specific subtopics.<br><br>**Part 1: HCI and BCI Lecture: (Lecture on methodological foundations of BCI): summer**<br><br>**Part 2: Hands on BCI implementation (practical seminar): summer**<br>Topics covered:<br>• A brief history of BCIs and examples of HCI control and basic neuroscience using BCI<br>• techniques.<br>• Data preprocessing (e.g. filtering, projection techniques) and common artifacts and<br>• artifact treatment) |

- Feature generation (e.g. fourier transform, spectral estimation techniques, principle
- components)
- Machine learning for classification and regression (e.g. model parameter optimization in
- multivariate regression)
- Evaluation (e.g. measures of model quality, cross validation to test model generalization,
- permutation tests)

Where possible the lecture provides mathematical backgrounds of the data analysis techniques.
The practical seminar implements BCI techniques on a real data set and further elaborates
specific topics in seminar form.

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| **Literaturempfehlungen** | |

There is no required textbook. The lecture slides and notes should be sufficient. However some
resources from which they were developed on are given below:

General tutorial text providing and overview and accompanying python code on github:

Holdgraf, Christopher R., Jochem W. Rieger, Cristiano Micheli, Stephanie Martin, Robert T.
Knight, and Frederic E. Theunissen. 2017. “Encoding and Decoding Models in Cognitive
Electrophysiology.” Frontiers in Systems Neuroscience 11.
https://doi.org/10.3389/fnsys.2017.00061. (open access)

Signal processing:

Semmlow, J. L. (2008). Biosignal and medical image processing. CRC press. Basis of most of
the signal processing section. Has some matlab code.

PCA & SVD

Shlens, Jonathon. 2014. “A Tutorial on Principal Component Analysis.” ArXiv:1404.1100 [Cs,
Stat], April. http://arxiv.org/abs/1404.1100. Great accessible tutorial on PCA

Unsupervised feature Learning and deep learning tutorial:

http://deeplearning.stanford.edu/tutorial/ Basis of the multivariate machine learning techniques.
Has some matlab code.

General texts:

Machine learning and AI:

Hastie, Tibshirani, and Friedman. The elements of statistical learning. Covers a wide range of
machine learning topics. Free online.

Russell and Norvig. Artificial Intelligence: A Modern Approach. A comprehensive reference
BCI

Dornhege et al. (2007) Toward Brain Machine Interfacing, The MIT-Press. A collection of essays
on BCI related topics.

Additional literature and material will be provided on the course website.

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| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will be offered every summer term. |

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|---|---|
| **Module capacity** | 15 |
| **Reference text** | PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy280, psy220 or psy290 to gain methodological competencies (EEG, fMRI, TBS, HCI, ambulatory assessment techniques) that are needed for most practical projects and Master's theses! |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture; Part 2: practical seminar |
| **Previous knowledge** | Basic programming skills, some high-school level maths |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | last lecture in summer term | The module will be evaluated with an oral exam (max. 20 min).<br><br>Required active participation for gaining credits:<br>1-2 presentations<br>max. 24 programming exercises in the seminar<br>participation in discussions on other presentations<br>attendance of at least 70% in the seminar within one semester (will be checked in StudIP). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | SoSe | 28 |
| Seminar | | 2 | SoSe | 28 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy240 - Computation in Neuroscience

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|---|---|
| **Module label** | Computation in Neuroscience |
| **Modulkürzel** | psy240 |
| **Credit points** | 9.0 KP |
| **Workload** | 270 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Stecher, Heiko (module responsibility)<br>• Stecher, Heiko (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will acquire scientific programming skills as well as specific knowledge of<br>computational methods in neuroscience and cognition. They will learn to judge the<br>appropriateness and complexity of computational problems and solutions.<br><br>**Competencies:**<br>+ Neuropsychological / neurophysiological knowledge<br>+ experimental methods<br>++ statistics & scientific programming<br>+ critical & analytical thinking<br>+ knowledge transfer<br>+ group work |
| **Module contents** | **Part 1: Introduction to scientific programming I (lecture): winter**<br>Basic data types and structures<br>Flow control (conditions, loops, errors)<br>Testing and debugging<br>Functions<br><br>**Part 2: Introduction to scientific programming II (lecture): summer**<br><br>Complex data structures<br><br>EEG processing<br>Frequency analysis methods<br><br>Introduction to toolboxes<br><br>**Part 3: Scientific programming I (excercise): winter**<br>Implementation of examples from part 1<br><br>**Part 4: Scientific programming II (exercise): summer**<br>Implementation of examples from part 2<br><br>**Part 5: Computer-controlled experimentation (hands-on seminar): summer**<br>Computer hardware basics<br>Scripting and programming experiments<br>Combining stimulus delivery with EEG, Eyetracking, etc.<br>Temporal precision |
| **Literaturempfehlungen** | |

- Mathworks (2009): MATLAB online documentation
- Wallisch P., et al. (2009): MATLAB for Neuroscientists: An Introduction to Scientific Computing in MATLAB. Elsevier/Academic

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|---|---|
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 2 Semester |
| **Module frequency** | The module will start every winter term. |
| **Module capacity** | unlimited |
| **Reference text** | Important note:<br>Passing the exam of psy240 is mandatory for starting a Practical Project (psy260) and the Master's thesis. |
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1 and 2: lectures; Part 3 and 4: excercises; Part 5: seminar; additional tutorials |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | exam period at the end of the summer term | In a 120-minute written exam the participants will have to program MATLAB-scripts for a selection of neuroscientific data-analysis problems, demonstrating their skills in the different topics. The scripts and comments will be written on university-provided laptops and handed in via email or USB-drive.<br><br>Students need to hand in 1-2 programming tasks in the exercises to be allowed to take part in the exam.<br><br>Required active participation for gaining credits:<br>script for the presentation of experimental stimuli in part 5<br>attendance of at least 70% in the seminar 'computer-controlled experimentation', part 5 within one semester (will be checked in StudIP). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | 2h/week in winter and summer term | 4 | SoSe und WiSe | 56 |
| Seminar | | 2 | SoSe | 28 |
| Exercises | 1h/week in winter and summer term | 2 | SoSe und WiSe | 28 |
| Tutorial | voluntary | | SoSe und WiSe | 0 |
| **Präsenzzeit Modul insgesamt** | | | | 112 h |

## psy251 - Internship

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|---|---|
| **Module label** | Internship |
| **Modulkürzel** | psy251 |
| **Credit points** | 12.0 KP |
| **Workload** | 360 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Kranczioch-Debener, Cornelia (module responsibility)<br>• Kranczioch-Debener, Cornelia (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will obtain direct experience in the field of psychology. This includes being<br>involved in the provision of psychological or neuropsychological services in real-life situations,<br>such as neuropsychological testing or counselling in a hospital or mental health clinic, or<br>conducting and contributing to psychological research. The internship should be chosen by the<br>student such that it can provide a meaningful educational opportunity that will help students to<br>decide on their preferred area of work.<br><br>**Competencies:**<br>++ expert neuropsychological/neurophysiological knowledge<br>+ interdisciplinary knowledge & thinking<br>+ experimental methods<br>++ ethics / good scientific practice / professional behavior<br>++ knowledge transfer<br>+ project & time management |
| **Module contents** | The students will work in a field of psychology of personal choice. The student will get to know and participate in the daily work routines of a psychologist. |
| **Literaturempfehlungen** | |
| **Links** | Information on internships and necessary forms:<br>https://uol.de/en/psychology/master/course-overview/ |
| **Languages of instruction** | English , German |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | irregular |
| **Module capacity** | unlimited |
| **Reference text** | The internship lasts 360 hours (9-10 weeks). It can be performed at 2 different institutions with a<br>minimum duration of 150 hours (4 weeks) for each part.<br><br>A part of your internship (maximally 150 hours) can be performed internally in the Department of<br>Psychology. Internal internships cannot be performed in the same lab in which you will perform /<br>have performed your Practical Project psy260!<br><br>Your supervisor must be a psychologist. If your supervisor is NOT a psychologist, please<br>contact us for approval BEFORE you start your internship.<br><br>Please note that details are regulated in the exam regulations.<br>A blank internship certificate and the report form can be found on the programme website.<br><br>To generate ideas, a folder with information on internships that other students have performed is<br>available in the office of Dr. Cornelia Kranczioch.<br><br>Topics for projects will be presented in a colloquium at the end of the summer |

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| | term. | |
| **Type of module** | Pflicht / Mandatory | |
| **Module level** | MM (Mastermodul / Master module) | |
| **Teaching/Learning method** | internship at (external) institution | |
| Examination | Prüfungszeiten | Type of examination |
| **Final exam of module** | Individual; 2-3 possibilities per semester to present the internship to other students | The students have to hand in a written report (2-3 pages) and give a short presentation about their internship. They have to show a certificate from the institution at which they performed the internship. The internship is evaluated as pass/fail. |
| **Form of instruction** | Practical training | |
| **SWS** | 0 | |
| **Frequency** | SoSe oder WiSe | |

## psy260 - Practical project

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|---|---|
| **Module label** | Practical project |
| **Modulkürzel** | psy260 |
| **Credit points** | 9.0 KP |
| **Workload** | 270 h<br>(<br>attendance in the lab and accompanying seminars as necessary for your project (~ 200h)<br>) |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Debener, Stefan (module responsibility)<br>• Herrmann, Christoph Siegfried (module responsibility)<br>• Hildebrandt, Andrea (module responsibility)<br>• Puschmann, Sebastian (module responsibility)<br>• Rieger, Jochem (module responsibility)<br>• Roheger, Mandy (module responsibility)<br>• Al-Zubaidi, Arkan (Prüfungsberechtigt)<br>• Bleichner, Martin Georg (Prüfungsberechtigt)<br>• Debener, Stefan (Prüfungsberechtigt)<br>• Gießing, Carsten (Prüfungsberechtigt)<br>• Hellmann, Andreas (Prüfungsberechtigt)<br>• Herrmann, Christoph Siegfried (Prüfungsberechtigt)<br>• Hildebrandt, Andrea (Prüfungsberechtigt)<br>• Hildebrandt, Helmut (Prüfungsberechtigt)<br>• Rieger, Jochem (Prüfungsberechtigt)<br>• Kranczioch-Debener, Cornelia (Prüfungsberechtigt)<br>• Özyurt, Jale Nur (Prüfungsberechtigt)<br>• Stecher, Heiko (Prüfungsberechtigt)<br>• Strüber, Daniel (Prüfungsberechtigt)<br>• Thiel, Christiane Margarete (Prüfungsberechtigt)<br>• Rosemann, Stephanie (Prüfungsberechtigt)<br>• Puschmann, Sebastian (Prüfungsberechtigt)<br>• Jäger, Manuela (Prüfungsberechtigt)<br>• Boetzel, Cindy (Prüfungsberechtigt)<br>• Vogeti, Sreekari (Prüfungsberechtigt)<br>• Roheger, Mandy (Prüfungsberechtigt)<br>• Daeglau, Mareike (Prüfungsberechtigt)<br>• Kristanto, Daniel (Prüfungsberechtigt)<br>• Abdolalizadeh Saleh, Amirhussein (Prüfungsberechtigt)<br>• Jacobsen, Nadine (Prüfungsberechtigt)<br>• Short, Cassie Ann (Prüfungsberechtigt)<br>• Marek, Merle (Module counselling) |
| **Further responsible persons** | Upon approval by the examination committee other staff members (e.g. PhD students in the laboratories of the Department of Psychology) can act as examiners for psy260. |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology.<br>**You can only start the practical project if you have passed the exam of psy240 (psy241)**<br>**Computation in Neuroscience!**<br>Priority is given to students with experience in methods used in the respective lab or students<br>who have taken the respective teaching modules. |
| **Skills to be acquired in this module** | **Goals of module:**<br><br>Students are able to critically review the scientific literature and current state of knowledge concerning a certain topic in the field of cognitive neuroscience or neuropsychology. Based on this, they are able to develop a specific research question and to design an adequate experiment, acquire data and conduct appropriate statistical analyses, building on previously gained competencies in relevant research methods, computer programming and statistical methods. They know how to critically discuss the results of their study in context of the current literature and how to present their findings at a scientific poster |

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| | symposium.<br><br>**Competencies:**<br>++ experimental methods<br>+ statistics & scientific programming<br>++ data presentation & discussion<br>+ independent research<br>+ scientific literature<br>+ ethics / good scientific practice / professional behavior<br>+ scientific communication skills<br>+ knowledge transfer<br>+ group work<br>++ project & time management |
| **Module contents** | • The students develop an empirical investigation, carry it out and analyse the results.<br>• The students present and discuss their project in respect to recent literature in regular meetings and in a poster symposium.<br>• Students can develop an experimental design for a follow-up study which could potentially be the topic of their Master's thesis.<br>• As part of the practical project, students should participate in studies of other practical projects! |
| **Literaturempfehlungen** | |
| **Links** | https://uol.de/en/psychology/master/course-overview/ |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will be offered every winter term. |
| **Module capacity** | unlimited |
| **Reference text** | Topics for projects will be presented in a colloquium at the end of the summer term.<br><br>Students can chose to perform the practical work in either of the research groups of the Department of Psychology. External projects are possible upon approval (information and approval form can be found on the programme website). |
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | practical work and regular seminar meetings in the group where the project is performed |
| **Previous knowledge** | PLEASE NOTE:<br><br>Knowledge of either EEG, fMRI, TBS, or MEG data analysis, or knowledge of HCI or ambulatory assessment methods is essential for most projects offered in the Department of Psychology. We strongly recommend to take either psy170: Neurophysiology, psy270: fMRI Data Analysis, psy280: Transcranial Brain Stimulation, psy220: Human Computer Interaction, or psy290: Ambulatory Assessment prior to the practical project.<br><br>It is expected that students have basic knowledge of Matlab programming before starting the practical project. This is proven by having passed the exam in Computation in Neuroscience. |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | usually end of April | Poster presentation in a student symposium (30% of the grade) and daily project work (70% of the grade). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Seminar | Please select the group in which you perform your practical project. | 2 | WiSe | 28 |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Practical training | attendance as necessary for your project (~ 200h) | | WiSe | 0 |
| **Präsenzzeit Modul insgesamt** | | | | 28 h |

## psy270 - Functional MRI Data Analysis

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|---|---|
| **Module label** | Functional MRI Data Analysis |
| **Modulkürzel** | psy270 |
| **Credit points** | 9.0 KP |
| **Workload** | 270 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Biology (Master) > Background Modules<br>• Master's Programme Neurocognitive Psychology (Master) > Mastermodule<br>• Master's Programme Neuroscience (Master) > Background Modules |
| **Zuständige Personen** | • Gießing, Carsten (module responsibility)<br>• Gießing, Carsten (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology, Neuroscience, or Biology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will learn the basics about planning and performing a neuroimaging study. They will<br>focus on the statistical and methodological background of functional neuroimaging data analysis<br>and analyse a sample functional MRI data set.<br><br>**Competencies:**<br>++ experimental methods<br>++ statistics & scientific programming<br>+ data presentation & discussion<br>++ group work |
| **Module contents** | Theoretical knowledge on functional MRI data analysis<br>Planning, performance and analysis of functional neuroimaging studies using MATLAB-based software<br>Hands-on fMRI data analysis with SPM |
| **Literaturempfehlungen** | • Frackowiak RSJ, Friston KJ, Frith C, Dolan R, Price CJ, Zeki S, Ashburner J, and Penny WD (2003). Human Brain Function. Academic Press, 2nd edition. San Diego, USA.<br>• Huettel, SA, Song, AW, & McCarthy, G (2009). Functional Magnetic Resonance Imaging (2nd Edition). Sinauer Associates. Sunderland, MA, USA.<br>• Poldrack RA, Mumford JA, & Nichols TE (2011). Handbook of Functional MRI Data Analysis. Cambridge University Press. New York, USA. |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will be offered every summer term. |
| **Module capacity** | 15 (<br><br>The remaining places are reserved for Biology and Neuroscience students. |

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| | ) |
| **Reference text** | Since the module is primarily offered for the Master's programme Biology it has to be offered as<br>a blocked course. Please contact us if you are interested in the module but have problems with<br>interfering other courses.<br><br>PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy280, psy220 or psy290 to gain methodological competencies (EEG, fMRI, TBS, HCI, ambulatory assessment techniques) that are needed for most practical projects and Master's theses! |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | blocked course with lecture, interactive seminar and exercise parts |
| **Previous knowledge** | Students need to have solid statistical knowledge as taught in the Introductory Course Statistics and in Research Methods. |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | middle of summer term | Oral or written examination<br><br>Required active participation for gaining credits:<br>1-2 presentations<br>participation in discussions on other presentations<br>attendance of at least 70% in the seminars and exercises within one semester (will be checked in StudIP). |

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| **Form of instruction** | Seminar |
| **SWS** | 1 |
| **Frequency** | SoSe |
| **Workload Präsenzzeit** | 14 h |

## psy280 - Transcranial Brain Stimulation

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|---|---|
| **Module label** | Transcranial Brain Stimulation |
| **Modulkürzel** | psy280 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Herrmann, Christoph Siegfried (module responsibility)<br>• Herrmann, Christoph Siegfried (Prüfungsberechtigt)<br>• Strüber, Daniel (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will gain theoretical and practical knowledge on various non-invasive brain stimulation<br>techniques.<br><br>**Competencies:**<br>++ Neuropsychological / neurophysiological knowledge<br>++ experimental methods<br>+ statistics & scientific programming<br>+ scientific literature<br>+ ethics / good scientific practice / professional behaviour |
| **Module contents** | In this module, we will introduce the theoretical concepts, neurophysiological underpinnings and<br>neurocognitive as well as clinical applications of various non-invasive brain stimulation<br>techniques such as transcranial magnetic stimulation (TMS), transcranial direct current<br>stimulation (tDCS), transcranial alternating current stimulation (tACS), and transcranial random<br>noise stimulation (tRNS). A focus will be tACS, because it is especially suited to modulate brain<br>oscillations which have been shown to correlate with cognitive processes.<br><br>**Part 1: Introduction to transcranial brain stimulation (lecture): summer**<br><br>• Historical overview of brain stimulation<br>• Different techniques (TMS, tDCS, tACS, tRNS)<br>• Physiological mechanisms (entrainment, after-effects etc.)<br>• The use of transcranial brain stimulation in cognitive neuroscience - Experimental parameters (intensity, electrode montage, etc.)<br>• Pros and cons of TMS vs. tACS<br>• Technical aspects (artefact correction, modelling current flow, etc.)<br>• Safety issues<br>• Ethical considerations of brain stimulation<br><br>**Part 2: Effects of tACS on physiology and cognition (seminar): summer**<br><br>• Physiology of tACS (on-line and after-effects)<br>• Modulating cognitive functions (e.g. memory, attention, and perception)<br>• Clinical applications of tACS<br>• Hands-on experience in the lab |
| **Literaturempfehlungen** | |

- Miniussi et al. Transcranial brain stimulation, CRC Press, 2013.
- Kadosh. The stimulated brain, Academic Press, 2014.

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|---|---|
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will be offered every summer term. |
| **Module capacity** | 10 |
| **Reference text** | PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy280, psy220 or psy290 to gain methodological competencies (EEG, fMRI, TBS, HCI, ambulatory assessment techniques) that are needed for most practical projects and Master's theses! |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | Part 1: lecture; Part 2: seminar |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | during summer term | Oral presentation in the seminar.<br><br>Required active participation for gaining credits: attendance of at least 70% in the seminar within one semester (will be checked in StudIP). |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | SoSe | 28 |
| Seminar | | 2 | SoSe | 28 |
| **Präsenzzeit Modul insgesamt** | | | | 56 h |

## psy285 - Study Abroad I - Psychology/Neuroscience

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|---|---|
| **Module label** | Study Abroad I - Psychology/Neuroscience |
| **Modulkürzel** | psy285 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Department of Psychology (module responsibility)<br>• Bleichner, Kerstin (Module counselling)<br>• Kranczioch-Debener, Cornelia (Module counselling) |
| **Further responsible persons** | Courses taken abroad will be approved by the examinations committee. |
| **Prerequisites** | |
| **Skills to be acquired in this module** | |
| **Module contents** | Successfully completed study achievements at Master's level from a study abroad are recognised to the extent of 6 credit points, provided that they originate from the fields of psychology or neuroscience and do not have any significant overlaps in content with modules of the compulsory and elective subjects that have already been studied/are still to be studied. |
| **Literaturempfehlungen** | |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | |
| **Module capacity** | unlimited |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | according to the regulations of the respective foreign university |

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|---|---|
| **Form of instruction** | VA-Auswahl<br>according to the regulations of the respective foreign university |
| **SWS** | 4 |
| **Frequency** | SoSe oder WiSe |

## psy286 - Study Abroad II - Psychology/Neuroscience

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| **Module label** | Study Abroad II - Psychology/Neuroscience |
| **Modulkürzel** | psy286 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Department of Psychology (module responsibility)<br>• Kranczioch-Debener, Cornelia (Module counselling)<br>• Bleichner, Kerstin (Module counselling) |
| **Further responsible persons** | Courses taken abroad will be approved by the examinations committee. |
| **Prerequisites** | |
| **Skills to be acquired in this module** | |
| **Module contents** | Successfully completed study achievements at Master's level from a study abroad are<br>recognised to the extent of 6 credit points, provided that they originate from the fields of<br>psychology or neuroscience and do not have any significant overlaps in content with modules ofthe compulsory and elective subjects that have already been studied/are still to be studied. |
| **Literaturempfehlungen** | |
| **Links** | |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | |
| **Module capacity** | unlimited |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | according to the regulations of the respective foreign university |

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|---|---|
| **Form of instruction** | VA-Auswahl<br>according to the regulations of the respective foreign university |
| **SWS** | 4 |
| **Frequency** | SoSe oder WiSe |
| **Workload Präsenzzeit** | 56 h |

## psy290 - Ambulatory Assessment in Psychology

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|---|---|
| **Module label** | Ambulatory Assessment in Psychology |
| **Modulkürzel** | psy290 |
| **Credit points** | 6.0 KP |
| **Workload** | 180 h |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Mastermodule |
| **Zuständige Personen** | • Roheger, Mandy (module responsibility)<br>• Roheger, Mandy (Prüfungsberechtigt)<br>• Bleichner, Martin Georg (Prüfungsberechtigt) |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will acquire specific knowledge about ambulatory assessment methods in psychological and public health research. They will know about the historical development of ambulatory assessment methods, the advantages and challenges of these methods and statistical methods for analyzing longitudinal data collected in ambulatory assessment research. Students will generate an own research idea and conduct their own study using ambulatory assessment tools such as e.g. mobile surveys or motion sensors. Students will be able to collect, analyze and present their data using ambulatory assessment tools.<br><br>**Competencies:**<br><br>++ Neuropsychological / neurophysiological knowledge<br>++ experimental methods<br>++ statistics & scientific programming<br>+ interdisciplinary knowledge & thinking<br>+ ethics / good scientific practice / professional behavior<br>+ critical & analytical thinking<br>+ project & time management |
| **Module contents** | **Part 1: Ambulatory Assessment in Psychology and Health Research (lecture): summer**<br><br>• Definitions and historical overview of ambulatory assessment (AmbA) methods<br>• Reasons to use AmbA methods<br>• Introduction to different types of AmbA methods<br>• Designing a study of daily life<br>• Examples of usage of AmbA methods in different research fields and different research questions<br>• Statistical analysis of longitudinal data<br><br>**Part 2: Researching daily life (hands-on seminar): summer**<br><br>• Formulating hypotheses<br>• Selecting AmbA procedures and planning administration<br>• Data collection<br>• Evaluating the application of AmbA methods<br>• Analyzing, summarizing and visualizing results |
| **Literaturempfehlungen** | Researching Daily Life: A Guide to Experience Sampling and Daily Diary Methods by Paul J. Silvia, Katherine N. Cotter |
| **Links** | |

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| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | The module will start every summer term. |
| **Module capacity** | unlimited |
| **Reference text** | PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy280, psy220 or psy290 to gain methodological competencies (EEG, fMRI, TBS, HCI, ambulatory assessment techniques) that are needed for most practical projects and Master's theses! |
| **Type of module** | Wahlpflicht / Elective |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | part 1: lecture, part 2: seminar |

| Examination | Prüfungszeiten | Type of examination |
|---|---|---|
| **Final exam of module** | | |
| | Assignments will be collected during the term. | The module will be tested by a portfolio (consisting of 3 assignments):<br>• A theoretical background of the planned study and the presentation of the hypothesis (text, max. 1 page) – due before starting data collection<br>• A visualization of the study results – due after finishing data collection and analysis<br>• A scientific abstract of the whole study at the end of the seminar – due at the end of the seminar<br><br>Required active participation for gaining credits:<br>• attendance of at least 70% in the seminar within one semester<br>• recording of AmbA data |

| Form of instruction | Comment | SWS | Frequency | Workload of compulsory attendance |
|---|---|---|---|---|
| Lecture | | 2 | SoSe oder WiSe | 0 |
| Seminar | | 2 | SoSe oder WiSe | 0 |
| **Präsenzzeit Modul insgesamt** | | | | 0 h |

# Abschlussmodul

## mam - Master´s Degree Module

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|---|---|
| **Module label** | Master´s Degree Module |
| **Modulkürzel** | mam |
| **Credit points** | 30.0 KP |
| **Workload** | 900 h<br>(<br><br>attendance in the lab meetings: 28h (2 SWS); thesis work: 872 hours<br><br>) |
| **Verwendbarkeit des Moduls** | • Master's Programme Neurocognitive Psychology (Master) > Abschlussmodul |
| **Zuständige Personen** | • Al-Zubaidi, Arkan (Prüfungsberechtigt)<br>• Bleichner, Martin Georg (Prüfungsberechtigt)<br>• Debener, Stefan (Prüfungsberechtigt)<br>• Gießing, Carsten (Prüfungsberechtigt)<br>• Rieger, Jochem (Prüfungsberechtigt)<br>• Hellmann, Andreas (Prüfungsberechtigt)<br>• Herrmann, Christoph Siegfried (Prüfungsberechtigt)<br>• Hildebrandt, Andrea (Prüfungsberechtigt)<br>• Boetzel, Cindy (Prüfungsberechtigt)<br>• Hildebrandt, Helmut (Prüfungsberechtigt)<br>• Kranczioch-Debener, Cornelia (Prüfungsberechtigt)<br>• Rosemann, Stephanie (Prüfungsberechtigt)<br>• Özyurt, Jale Nur (Prüfungsberechtigt)<br>• Stecher, Heiko (Prüfungsberechtigt)<br>• Strüber, Daniel (Prüfungsberechtigt)<br>• Thiel, Christiane Margarete (Prüfungsberechtigt)<br>• Puschmann, Sebastian (Prüfungsberechtigt)<br>• Vogeti, Sreekari (Prüfungsberechtigt)<br>• Jäger, Manuela (Prüfungsberechtigt)<br>• Roheger, Mandy (Prüfungsberechtigt)<br>• Daeglau, Mareike (Prüfungsberechtigt)<br>• Kristanto, Daniel (Prüfungsberechtigt)<br>• Jacobsen, Nadine (Prüfungsberechtigt)<br>• Short, Cassie Ann (Prüfungsberechtigt)<br>• Abdolalizadeh Saleh, Amirhussein (Prüfungsberechtigt) |
| **Further responsible persons** | thesis supervisors;<br>Upon approval by the examination committee other staff members (e.g. PhD students in the laboratories of the Department of Psychology) can act as examiners for mam. |
| **Prerequisites** | Enrolment in Master's programme Neurocognitive Psychology.<br>Completion of at least 60 credit points in other modules including module psy240 (psy241) (Computation in Neuroscience).<br>Assignment of a topic by thesis supervisor and official application with the examination office. |
| **Skills to be acquired in this module** | **Goals of module:**<br>Students will demonstrate that they are able to perform a psychological or neuroscientific experiment and/or analyze data originating from such experiments by means of methods according to contemporary scientific standards. Metaanalyses are accepted if they were conducted by means of up to date tools for data extraction and analyses, according to best practices outlined in relevant community guidelines, such as for example Cochrane. In addition, the students will demonstrate that they are acquainted with the necessary methods and can present their results orally and in written form.<br><br>**Competencies:**<br>++ experimental methods<br>+ statistics & scientific programming |

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| | + data presentation & discussion<br>++ independent research<br>+ scientific literature<br>++ scientific English / writing<br>+ ethics / good scientific practice / professional behavior<br>+ critical & analytical thinking<br>+ scientific communication skills<br>+ knowledge transfer<br>++ project & time management |
| **Module contents** | **Part 1: Master's thesis**<br>The students work on a given topic in cognitive neuroscience using literature research and the<br>appropriate experimental methods.<br><br>**Part 2: Master's colloquium**<br>The preparation of the thesis is accompanied by regular participation in the lab meetings of the<br>groups in which the thesis is performed. Students present their study design at the beginning of<br>their thesis preparation and their results towards the end. In addition, they listen to the<br>presentations of the other lab members and students in the group. |
| **Literaturempfehlungen** | |
| **Links** | Rules and guidelines for Master's theses are explained here:<br>https://uol.de/en/psychology/master/course-overview/ |
| **Language of instruction** | English |
| **Duration (semesters)** | 1 Semester |
| **Module frequency** | irregular |
| **Module capacity** | unlimited |
| **Reference text** | If you want to do a Master's thesis outside the Department of Psychology, please follow the rules stated on the program website.<br>We encourage students to use the LaTeX template provided on the course website. We usually offer a workshop on how to use LaTeX once a year. |
| **Type of module** | Pflicht / Mandatory |
| **Module level** | MM (Mastermodul / Master module) |
| **Teaching/Learning method** | individual thesis preparation with supervision |
| **Previous knowledge** | contact your supervisor for details |

| Examination | Prüfungszeiten | Type of examination |
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| **Final exam of module** | individual appointments | The written thesis will be evaluated by the daily supervisor and an additional reviewer (second supervisor) (90%).<br>The oral presentation and defence of the thesis results will be evaluated by both supervisors (10%). |

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| **Form of instruction** | Seminar und Projekt |
| **SWS** | 2 |
| **Frequency** | SoSe und WiSe |
| **Workload Präsenzzeit** | 28 h<br>*Attendance as required for your project and 2 hours per week for participating in the lab meetings.* |