Mastermodule

psy110 - Research methods

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Research methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy110</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>12.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>360 h</td>
</tr>
<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
</tbody>
</table>

Ansprechpartner/-in

- Modulverantwortung
  - Andrea Hildebrandt

Teilnahmevoraussetzungen

Enrolment in Master's programme Neurocognitive Psychology.

Kompetenzziele

Goals of module:

Students will acquire basic knowledge in planning empirical investigations, setting up computer controlled experiments, managing and understanding quantitative data and conducting a wide variety of multivariate statistical analyses. They will learn how to use the statistical methodology in terms of good scientific practice and how to interpret, evaluate and synthesize empirical results from the perspective of statistical modeling and statistical learning in basic and applied research context. The courses in this module will additionally point out statistical misconceptions and help students to overcome them.

Competencies:

- ++ interdisciplinary knowledge & thinking
- ++ statistics & scientific programming
- ++ data presentation & discussion
- independent research
- scientific literature
- ++ ethics / good scientific practice / professional behavior
- ++ critical & analytical thinking
- ++ scientific communication skills
- + group work

Modulinhalte

Part 1: Multivariate Statistics I (lecture)

- Graphical representation of data
- Basic concepts of probability
- Frequentist and Bayesian statistical inference
- The Generalized Linear Modeling framework (Simple, multiple and moderated linear regression, Analyses of variance as a specific case of the General Linear Model, Logistic regression)
- Multilevel regression
- Path modeling
- Factor analysis (exploratory & confirmatory)
- Structural equation modeling

Part 2: Computer-controlled experimentation (seminar)

- Computer hardware basics
- Scripting and programming in Presentation
- Combining stimulus delivery with EEG
- Temporal precision

Part 3: Multivariate Statistics II (lecture)

- Supervised and unsupervised statistical learning and prediction
- Regularized regression and non-linear models
- Resampling methods
- Tree-based methods and Support Vector Machines
- Principal components and clustering

Part 4: Evaluation research (seminar)

- Paradigms and methods in applied evaluation research (quantitative, mixed-methods)
- Types of studies and designs in evaluation research (experimental, quasi-experimental, (multiple) time series, etc.)
- Specific statistical tools (e.g., Propensity score matching)
- Research synthesis and meta-analysis

**Literaturempfehlungen**

**Links**

**Unterrichtssprache** Englisch

**Dauer in Semestern** 2 Semester

**Angebotsrhythmus Modul** The module will be offered every winter term.

**Aufnahmekapazität Modul** unbegrenzt

**Modullevel** MM (Mastermodul / Master module)

**Modulart** Pflicht / Mandatory

**Lern-/Lehrform / Type of program** Parts 1 and 3: lectures; Parts 2 and 4: seminars; additional tutorials are offered.

**Vorkenntnisse / Previous knowledge** basic statistics; otherwise please attend Introductory Course Statistics

### Prüfung

- **Gesamtmodul**
  - The module will be tested with an oral exam (20 min). Bonus for creating a script for the presentation on experimental stimuli in part 2.

### Lehrveranstaltungsform

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vorlesung</td>
<td>part 1: 8 semester hours per week in the second half of the winter term, part 3: 2 semester hours per week in summer term</td>
<td>6.00</td>
<td>SoSe und WiSe</td>
<td>84 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>Part 2: 2 semester hours per week in the winter term. Part 4: 2 semester hours per week in summer term</td>
<td>4.00</td>
<td>SoSe und WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Tutorium</td>
<td>winter term: 2 hours/week (statistics) summer term: 2 x 2 hours/week (statistics and R)</td>
<td>0.00</td>
<td>SoSe und WiSe</td>
<td>0 h</td>
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</tbody>
</table>

**Präsenzzeit Modul insgesamt** 140 h
**psy120 - Psychological diagnostics**

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Psychological diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy120</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td>Verwendet in Studiengängen</td>
<td>• Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
</tbody>
</table>

**Ansprechpartner/-in**

- Modulverantwortung
  - Andrea Hildebrandt
  - Andreas Hellmann
- Prüfungsberechtigt
  - Andrea Hildebrandt
  - Andreas Hellmann
- Modulberatung
  - Stefan Debener

**Teilnahmevoraussetzungen**

- Enrolment in Master's programme Neurocognitive Psychology.

**Kompetenzziele**

Goals of module:
Students will acquire specific knowledge about psychological assessment and will be trained to utilize this knowledge within a research context and in applied settings. With respect to research applications they will learn about traditional and modern test theories and about their usage in the domain of test construction and the systematic design of interviews and observational methods. From the perspective of applied assessment, students will reflect on the assessment process as a whole. They will learn how to analyze cases ("case conceptualization"), how to plan and conduct the information assessment phase, how to record and summarize collected data and how to integrate across the multitude of information in order to draw conclusions about the case given specific diagnostic strategies (status vs. process assessment and norm oriented vs. criterion oriented assessment, including classificatory decisions). Finally, students will learn about the requirements of 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.

Competencies:
- Neuropsychological / neurophysiological knowledge
- Interdisciplinary knowledge & thinking
- Ethics / good scientific practice / professional behavior
- Critical & analytical thinking

**Modulinhalte**

**Part 1: Introduction to Psychological Assessment (lecture)**

- Psychological assessment as a decision process – descriptive and prescriptive models
- Theories of reliability (classical and modern approaches)
- Theories of validity (classical and modern approaches)
- Assessment methods, their construction and design, quality criteria
- The logic of decision making in the assessment process
- Psychometrics to single cases
- Summarizing results and writing reports

**Part 2: Psychological Testing (seminar)**

- Psychometric bases of tests and questionnaires
- Types of tests and questionnaires
- Challenges in psychological testing (for example faking good vs. bad)
- Examples of published tests and questionnaires
- Exercising test applications, scoring and result interpretations

**Part 3: Assessment in Clinical Neuropsychology (seminar)**

- Specific knowledge
- Exercises in testing / practising tests

**Literaturempfehlungen**

- Will be specified in the courses.

**Links**

- Unterrichtssprache: Englisch
- Dauer in Semestern: 2 Semester
<table>
<thead>
<tr>
<th>Angebotsrhythmus Modul</th>
<th>The module will be offered every winter term.</th>
</tr>
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<tbody>
<tr>
<td>Aufnahmekapazität Modul</td>
<td>unbegrenzt</td>
</tr>
<tr>
<td>Hinweise</td>
<td>If you want to earn the bonus, you need to use the official bonus sheet to prove your attendance which will be handed to you in the beginning of the winter term.</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: 1 lecture ; Part 2: 1 seminar; Part 3: 1 seminar</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>Part 1: 1 lecture ; Part 2: 1 seminar; Part 3: 1 seminar</td>
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</table>

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>summer term</td>
<td>The module will be tested by a practical exercise (test application and protocol). Bonus for two presentations or test executions (max.) and attendance of at least 70% in the seminars. Group presentations can be counted as one half.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
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</thead>
<tbody>
<tr>
<td>Vorlesung</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SoSe</td>
<td>56 h</td>
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| Präsenzzeit Modul insgesamt | 84 h |
# Communication of scientific results

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Modulcode</td>
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<td>Kreditpunkte</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
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</table>

**Ansprechpartner/-in**
- Modulverantwortung: Christoph Siegfried Herrmann
- Modulberatung: Daniel Strüber

**Teilnahmevoraussetzungen**
Enrolment in Master's programme Neurocognitive Psychology.

**Kompetenzziele**
Goals of module:
Students will acquire specific knowledge about the presentation of scientific results both orally and in writing. Students will learn modern techniques for presentation, literature research and writing skills. They will also be taught about arguing scientifically.

Competencies:
++ data presentation & discussion
++ scientific literature
++ scientific English / writing
++ scientific communication skills
+ group work

**Modulinhalte**

**Part 1: Communication of scientific results (seminar)**
- Literature search
- Presentation skills
- Writing skills

**Part 2: Psychological colloquium**
Experienced scientists from various psychological disciplines will be giving talks about their experimental results. Speakers will be invited also from other universities. Students are encouraged to discuss the results with the experts and to make suggestions on whom to invite.

**Literaturempfehlungen**

**Links**
- Englisch

**Dauer in Semestern**
1-2 Semester

**Angebotsrhythmus Modul**
Part 1 will be offered every winter term. Part 2 will be offered every semester.

**Hinweise**
Students can chose whether they want to attend the colloquium in the first, second or both semesters.

If you want to earn the bonus, you need to use the official bonus sheet to prove your attendance which will be handed to you in the beginning of the winter term.

**Modullevel**
MM (Mastermodul / Master module)

**Modulart**
Pflicht / Mandatory

**Lern-/Lehrform / Type of program**
Communication of scientific results: seminar; Psychological colloquium: colloquium

**Prüfung**

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
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</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>during winter term</td>
<td>The module requires an oral presentation that will be evaluated. Bonus for active participation (contribution to discussion, e.g. questions or comments) during the colloquium and attendance of at least 8 colloquium sessions.</td>
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</table>

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
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<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
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<tbody>
<tr>
<td>Seminar</td>
<td></td>
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<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Lehrveranstaltungsform</td>
<td>Kommentar</td>
<td>SWS</td>
<td>Angebotsrhythmus</td>
<td>Workload Präsenzzeit</td>
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<td>------------------------</td>
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</tr>
<tr>
<td>Kolloquium</td>
<td>2.00</td>
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<td>SoSe und WiSe</td>
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<td><strong>Präsenzzeit Modul insgesamt</strong></td>
<td></td>
<td></td>
<td></td>
<td>56 h</td>
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psy140 - Minor

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Minor</th>
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<tbody>
<tr>
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<td>psy140</td>
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<tr>
<td>Kreditpunkte</td>
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<td>Workload</td>
<td>270 h</td>
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<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
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<tr>
<td>Ansprechpartner/-in</td>
<td>Modulberatung</td>
</tr>
<tr>
<td></td>
<td>Kerstin Bleichner</td>
</tr>
<tr>
<td></td>
<td>Jochem Rieger</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Kompetenzziele</td>
<td>Goals of module: 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.</td>
</tr>
<tr>
<td></td>
<td>Competencies: ++ interdisciplinary knowledge &amp; thinking</td>
</tr>
<tr>
<td>Modulinhalte</td>
<td>Students can take Master modules and courses from the fields</td>
</tr>
<tr>
<td></td>
<td>• Biology</td>
</tr>
<tr>
<td></td>
<td>• Neurosciences</td>
</tr>
<tr>
<td></td>
<td>• Computer Science</td>
</tr>
<tr>
<td></td>
<td>• Physics</td>
</tr>
<tr>
<td></td>
<td>• Mathematics</td>
</tr>
<tr>
<td></td>
<td>• Pedagogy</td>
</tr>
<tr>
<td></td>
<td>• Philosophy</td>
</tr>
<tr>
<td></td>
<td>• related fields</td>
</tr>
</tbody>
</table>

The content of the courses/modules taken as Minor needs to be clearly different from the contents of the Neurocognitive Psychology modules.

A list of approved courses/modules can be found on our website.

Upon approval, German-speaking students can attend a career-relevant language course (i.e. necessary for internship, practical project or Master's thesis; maximum of 6 CP for this module).

Students whose first language is not German, may take German classes.

We recommend taking modules/courses that strengthen your own professional profile.

Literaturempfehlungen


Unterrichtsprachen | Englisch, Deutsch

Dauer in Semestern | 1 Semester

Angebotsrhythmus Modul | irregular

Aufnahmekapazität Modul | unbegrenzt

Hinweise | PLEASE NOTE:
|          | • If you want to take a module/course which is not listed in the list of approved courses/modules, please request approval BEFORE you start the course/module (list of approved courses/modules and approval form can be found on our website)
|          | • Bachelor courses/modules (that are also offered in Master of Education programmes) are NOT acceptable! (Please check in StudIP)
|          | • It is your responsibility to ask the teacher whether you can take part.

Modullevel | MM (Mastermodul / Master module)

Modulart | Pflicht / Mandatory

Lern-/Lehrform / Type of program | Lectures and seminars (depends on the chosen modules)

Vorkenntnisse / Previous knowledge

Prüfung | Prüfungszeiten | Prüfungsform

Gesamtmodul | If grades are earned in the minor, those are counted as pass/fail. Certificates for grades can be separately requested from the examination office.

Lehrveranstaltungsform | Vorlesung oder Seminar
(Please refer to the module description for information on the courses you can have counted towards psy140 Minor.)

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<thead>
<tr>
<th>SWS</th>
<th>0.00</th>
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<tr>
<td>Angebotsrhythmus</td>
<td>SoSe und WiSe</td>
</tr>
<tr>
<td>Workload Präsenzzeit</td>
<td>0 h (Depends on the chosen course, but at least 14 hours attendance.)</td>
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</table>
# psy150 - Clinical Psychology

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Clinical Psychology</th>
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</thead>
<tbody>
<tr>
<td>Modulcode</td>
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<tr>
<td>Kreditpunkte</td>
<td>9.0 KP</td>
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<tr>
<td>Workload</td>
<td>270 h</td>
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<tr>
<td>Verwendet in Studiengängen</td>
<td>• Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Modulverantwortung</td>
</tr>
<tr>
<td></td>
<td>˃ Christiane Margarete Thiel</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
</tbody>
</table>

## Kompetenzziele

Goals of the Module:

- Students acquire scientifically sound, critical thinking regarding the genesis and psychopharmacological treatment of various mental illnesses; decision making based on the medical guidelines and evidence-based practice.

Competencies:

- ++ Neuropsychological / neurophysiological knowledge
- + experimental methods
- + data presentation & discussion
- + scientific literature
- + critical & analytical thinking
- + knowledge transfer

## Modulinhalte

The first part of the module provides students with a theoretical and practical background on neurobiological and neurochemical bases of psychiatric disorders and pharmacological interventions. This will be complemented by psychiatric interviews in simulated patients focussing on psychopathological assessment. In the second part, the students will learn to plan and assess the effectiveness of psychological interventions for selected disorders.

**Part 1: Neurobiological basis of psychiatric disorders and pharmacological intervention (lecture and seminar)**

- Basics of neurotransmitter systems and psychopharmacology
- Substance Abuse (e.g. psychostimulants, hallucinogens)
- Depression
- Anxiety Disorders
- Alzheimer's Disease
- Schizophrenia
- psychopathological assessment

**Part 2: Psychological interventions within the framework of evidence-based medicine (seminar)**

- (partly in German): Concepts of evidence based treatment and treatment of acquired dysfunctions of the brain
- Treatment of ADHD

## Literaturempfehlungen

- Selected papers (part 2)

## Links

- Unterrichtsprachen: Englisch, Deutsch
- Dauer in Semestern: 2 Semester
- Angebotsrhythmus Modul: Part 1 will be offered every winter term, part 2 every summer term.
- Aufnahmekapazität Modul: unbegrenzt
- Modullevel: MM (Mastermodul / Master module)
- Modulart: Wahlpflicht / Elective
- Lern-/Lehrform / Type of program: Part 1: lecture and seminar; part 2: seminar
### Vorkenntnisse / Previous knowledge

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>in the term holiday (usually March)</td>
<td>The module will be tested with a written exam (2 h) on the contents of part 1. Bonus for a presentation and participation in discussions or group work in other parts of the module (the bonus must be achieved in all other classes/events).</td>
</tr>
</tbody>
</table>

### Lehrveranstaltungsform

<table>
<thead>
<tr>
<th>Veranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vorlesung</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SoSe und WiSe</td>
<td>56 h</td>
</tr>
</tbody>
</table>

| Präsenzzeit Modul insgesamt | 84 h |
psy170 - Neurophysiology

Modulbezeichnung: Neurophysiology
Modulcode: psy170
Kreditpunkte: 6.0 KP
Workload: 180 h

Verwendet in Studiengängen:
- Master Neurocognitive Psychology > Mastermodule

Ansprechpartner/-in:
- Modulverantwortung: Stefan Debener

Teilnahmevoraussetzungen:
Enrolment in Master’s programme Neurocognitive Psychology.

Kompetenzziele:
Goals of module:
Students will understand the basic concepts of biomedical signal processing. They will use EEG analysis tools interactively and independently and will understand the complete chain of EEG analysis steps, from data import to the illustration of results. They will be able to use open source tools for EEG analysis and apply theoretical knowledge to practical problems of physiology.

Competencies:
++ Neuropsychological / neurophysiological knowledge
++ experimental methods
++ statistics & scientific programming
++ ethics / good scientific practice / professional behavior
++ group work
++ project & time management

Modulinhalte:
Students will acquire specific knowledge about neurophysiology and neuroanatomy, learn the fundamental concepts of multi-channel EEG analysis, and acquire hands-on skills in using EEGLAB, an open-source software toolbox for advanced EEG analysis.

Part 1: Neurophysiology and neuroanatomy (lecture)
- Neurophysiology, EEG, EMG, ECG
- Neuroanatomy
- Time-domain and frequency-domain analysis methods

Part 2: EEG recording and analysis (theoretical-practical seminar)
- Recording and analysis of biomedical signals
- Averaging, filtering, signal-to-noise
- Topographical EEG analysis

Part 3: EEG analysis with Matlab (theoretical-practical seminar)
- EEGLAB file I/O, data structure and scripting
- Preprocessing, artefact rejection and artefact correction
- Statistical decomposition
- Event-related potentials, topographical mapping and power spectra
- Illustration of results

Literaturempfehlungen:

Links:
- Unterrichtssprache: Englisch
- Dauer in Semestern: 2 Semester
- Angebotsrhythmus Modul: The module will be offered every winter term.
- Aufnahmekapazität Modul: 18 (The lecture is not restricted.)
PLEASE NOTE:
We strongly recommend to take either psy170, psy270, psy275, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!

<table>
<thead>
<tr>
<th>Modullevel</th>
<th>MM (Mastermodul / Master module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: theoretical-practical seminar; Part 3: theoretical-practical seminar; additional tutorial</td>
</tr>
</tbody>
</table>

Prüfung | Prüfungszeiten | Prüfungsform |
--- | --- | --- |
| Gesamtmodul | exam period at the end of the summer term | The module will be tested with a written exam of 2 h duration. Bonus for recording electroencephalographic data. |

<table>
<thead>
<tr>
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<th>Workload Präsenzzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vorlesung</td>
<td>2 semester hours per week in first half of the winter term.</td>
<td>1.00</td>
<td>WiSe</td>
<td>14 h</td>
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<tr>
<td>Theorie-Praxis-Seminare</td>
<td>2 semester hours per week in second half of the winter term. 2 semester hours per week in summer term.</td>
<td>3.00</td>
<td>SoSe und WiSe</td>
<td>42 h</td>
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<tr>
<td>Tutorium</td>
<td>2 hours/week</td>
<td>0.00</td>
<td>SoSe</td>
<td>0 h</td>
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| Präsenzzeit Modul insgesamt | 56 h |
**psy181 - Neurocognition**

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Neurocognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy181</td>
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<tr>
<td>Kreditpunkte</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Modulverantwortung</td>
</tr>
<tr>
<td></td>
<td>Christiane Margarete Thiel</td>
</tr>
<tr>
<td>Kompetenzziele</td>
<td>Goals of module: Students should be able to recognize and critically evaluate the value of considering neuroscience in the study of psychological topics.</td>
</tr>
<tr>
<td></td>
<td>Competencies: ++ neuropsychological / neurophysiological knowledge</td>
</tr>
<tr>
<td></td>
<td>++ interdisciplinary knowledge &amp; thinking</td>
</tr>
<tr>
<td></td>
<td>++ data presentation &amp; discussion</td>
</tr>
<tr>
<td></td>
<td>++ scientific literature</td>
</tr>
<tr>
<td></td>
<td>++ scientific communication skills</td>
</tr>
<tr>
<td></td>
<td>++ group work</td>
</tr>
<tr>
<td>Modulinhalte</td>
<td>Students will first acquire a general understanding of the brain mechanisms of different cognitive functions and the methods used to study these functions. They will then apply this knowledge by discussing current research topics (part 1). General knowledge will be focused on the relation between the development of the human brain and the cognitive processes it supports (part 2).</td>
</tr>
<tr>
<td></td>
<td>Part 1: Introduction to cognitive neuroscience (lecture and seminar)</td>
</tr>
<tr>
<td></td>
<td>• Brain and cognition, methods of cognitive neuroscience</td>
</tr>
<tr>
<td></td>
<td>• Attention, learning and memory</td>
</tr>
<tr>
<td></td>
<td>• Emotional and social behaviour</td>
</tr>
<tr>
<td></td>
<td>• Language, executive functions</td>
</tr>
<tr>
<td></td>
<td>Part 2: Neurocognitive development (seminar)</td>
</tr>
<tr>
<td></td>
<td>• Brain development and cortical plasticity</td>
</tr>
<tr>
<td></td>
<td>• Effects of early-life stress on brain development</td>
</tr>
<tr>
<td></td>
<td>• Development of object recognition, social cognition, memory, and executive functions</td>
</tr>
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**Links**

<table>
<thead>
<tr>
<th>Unterrichtssprache</th>
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<tr>
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<tr>
<td>Aufnahmekapazität Modul</td>
<td>20 (Part 1 (lecture and seminar) are unrestricted, part 2 is restricted to 20 students.)</td>
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<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
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<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: lecture and seminar; Part 2: seminar</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
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</tr>
<tr>
<td>Prüfung</td>
<td>in the term holidays (usually March)</td>
</tr>
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<td>Prüfungszeiten</td>
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<td>Prüfungsf orm</td>
<td>The module will be tested with a written exam of 2 h duration on the contents of part 1.</td>
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<td>Prüfungszeiten</td>
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</table>
psy190 - Sex and Cognition

Modulebezeichnung: Sex and Cognition
Modulcode: psy190
Kreditpunkte: 6.0 KP
Workload: 180 h
Verwendet in Studiengängen: Master Neurocognitive Psychology > Mastermodule
Ansprechpartner/-in: Modulverantwortung
Daniel Strüber

Teilnahmevoraussetzungen:
Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.

Kompetenzziele: Goals of module:
Students will acquire specific knowledge about sex differences in cognitive abilities and social behaviours. They will be able to understand the interrelated impact of social and biological influences on the brain's control of the (sex-specific) behaviours. Students should be able to critically evaluate behavioural sex differences from different perspectives and to reflect on possible implications for society.

Competencies:
++ neuropsychological / neurophysiological knowledge
+ interdisciplinary knowledge & thinking
++ data presentation & discussion
++ scientific literature
+ critical & analytical thinking
++ scientific communication skills
+ group work
+ project & time management

Modulinhalte:
Part 1: Introduction to the study of sex differences (lecture)
- The measurement of sex differences
- Sex differences in emotion
- Sex differences in aggression
- Sex differences in cognitive abilities
- Hormones, sexual differentiation, and gender identity
- Sex hormones and play preferences
- Sex differences in hemispheric organization
- Brain size and intelligence

Part 2: Sex, brain, and behaviour (seminar)
- Sex differences in empathy
- The extreme male brain theory of autism (S. Baron-Cohen)
- Sex differences in neuropsychiatric disorders
- Sex differences in stress response
- Social implications of sex differences

Literaturrempfehlungen:

Links:
Unterrichtssprache: Englisch
Dauer in Semestern: 1 Semester
Angebotsrhythmus Modul: The module will be offered every summer term.
Aufnahmekapazität Modul: 30
Modullevel: MM (Mastermodul / Master module)
Modulart: Wahlpflicht / Elective
Lern-/Lehrform / Type of program: Part 1: lecture; Part 2: seminar
Vorkenntnisse / Previous knowledge:

Unterrichtssprache: Englisch
Dauer in Semestern: 1 Semester
Angebotsrhythmus Modul: The module will be offered every summer term.
Aufnahmekapazität Modul: 30
Modullevel: MM (Mastermodul / Master module)
Modulart: Wahlpflicht / Elective
Lern-/Lehrform / Type of program: Part 1: lecture; Part 2: seminar
Vorkenntnisse / Previous knowledge:
<table>
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<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
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<td>Gesamtmodul</td>
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<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
</tr>
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<tbody>
<tr>
<td>Vorlesung</td>
<td></td>
<td>2.00</td>
<td>SoSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>SoSe</td>
<td>28 h</td>
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| Präsenzzeit Modul insgesamt | 56 h |


# psy200 - Neuropsychology

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<th>Neuropsychology</th>
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<tr>
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<td>Workload</td>
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<td>Verwendet in Stuudiengängen</td>
<td>• Master Neurocognitive Psychology &gt; Mastermodule</td>
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<td>Modulverantwortung</td>
</tr>
<tr>
<td></td>
<td>Stefan Debener</td>
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## Teilnahmevoraussetzungen
Enrolment in Master's programme Neurocognitive Psychology.

## Kompetenzziele
Goals of module:
Students will learn to understand changes in thinking and behaviour that may arise from brain dysfunctions (part 1, 4), acquire specific knowledge on cognitive rehabilitation (part 2), and learn to understand, communicate and evaluate progress in clinical practice and experimental research in neuropsychology (part 3, 4).

Competencies:
++ neuropsychological / neurophysiological knowledge
+ inter disciplinary knowledge & thinking
++ experimental methods
+ data presentation & discussion
++ scientific literature
+ critical & analytical thinking
+ scientific communication skills

## Modulinhalte

### Part 1: Introduction to Clinical Neuropsychology (lecture)
- Cortical lobes (anatomy, functions, lesion symptoms, neuropsychological tests)
- Higher functions (learning & memory, language, emotion, spatial behavior attention)
- Plasticity and disorders (development, learning and reading disabilities, recovery)

### Part 2: Cognitive Neurorehabilitation (seminar)
- Behavioural and neuropsychological approaches
- neurofeedback in neurorehabilitation and ADHD
- memory rehabilitation
- effects of physical activity on cognition
- motor recovery

### Part 3: Research Colloquium Clinical and Experimental Neuropsychology (colloquium)
- Presentations covering recent advances in the field of Experimental and Clinical Neuropsychology

### Part 4: Topics in Clinical Neuropsychology (seminar; taught partly in German)
- Clinical neuroanatomy
- Neurodegenerative diseases
- Dementia

## Literaturempfehlungen

## Links

## Unterrichtsprachen
Englisch, Deutsch

## Dauer in Semestern
2-3 Semester

## Angebotsrhythmus Modul
The module will be offered every winter term.

## Aufnahmekapazität Modul
30 (Part 4 is not restricted.)

## Hinweise
3 CP for each module part, choose 3 out of 4 parts! Part 1 (lecture) is mandatory.

If you want to earn the bonus, you need to use the official bonus sheet to prove your attendance which will be handed to you in the beginning of the winter term.

## Modullevel
MM (Mastermodul / Master module)
Modulart: Wahlpflicht / Elective

**Lern-/Lehrform / Type of program**  Part 1: lecture; Part 2: seminar; Part 3: colloquium; Part 4: seminar

**Vorkenntnisse / Previous knowledge**

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<td>The module will be tested with a written exam of 2 h duration. Bonus for a presentation and participation in discussions on other presentations and attendance of at least 70% in the seminars and colloquium.</td>
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**Lehrveranstaltungsform**

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
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<tbody>
<tr>
<td>Vorlesung</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
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<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SoSe und WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Kolloquium</td>
<td></td>
<td>2.00</td>
<td>SoSe</td>
<td>28 h</td>
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**Präsenzzeit Modul insgesamt**  112 h
psy210 - Applied Cognitive Psychology

Modulbezeichnung: Applied Cognitive Psychology

Modulcode: psy210

Kreditpunkte: 6.0 KP

Workload: 180 h

Verwendet in Studiengängen:
- Master Neurocognitive Psychology > Mastermodule

Ansprechpartner/-in:
- Modulverantwortung: Jochem Rieger

Teilnahmevoraussetzungen:
Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.

Kompetenzziele:
Goals of the module:
Students will gain an overview of theories of (Neuro)Cognitive Psychology with potential for application. On completion of this module students should have a repertoire of cognitive psychology concepts relevant for real world situations, be able to transfer the learned theoretical concepts into practical contexts and evaluate potential issues arising in the process of translation.

Competencies:
- ++ Neuropsychological / neurophysiological knowledge
- + interdisciplinary knowledge & thinking
- + experimental methods
- + scientific literature
- + ethics / good scientific practice / professional behavior
- + critical & analytical thinking
- + scientific communication skills
- + knowledge transfer

Modulinhalte:
The module will cover core concepts of cognitive psychology, their neuronal basis, basic knowledge of neuroimaging and data analysis techniques. Special emphasis will be put on research aiming at complex real-world settings and translation of basic science into practice. Examples of successful transfers will be analyzed. The lecture provides the theoretical basis. In the seminar the material is consolidated by examples from the literature which will be presented, critically analyzed and discussed.

Part 1: (Neuro)Cognitive Psychology in the wild I (lecture)
- Neurocognitive Psychology with emphasis in real world context
- Methodological considerations: Generalization, validity of theories and research methods
- Information uptake and representation: Sensation, perception, categorization
- Selection of information and capacity: Attention and memory enhancement and failure
- Generation and communication: Language, reading, dyslexia
- Pursuing goals: Thinking, problem solving and acting

Part 2: (Neuro)Cognitive Psychology in the wild II (seminar)
The goal is to apply novel knowledge from the lecture to understand and critically discuss actual research approaches.

Literaturempfehlungen:

Links:

Unterrichtssprache: Englisch

Dauer in Semestern: 1 Semester

Angebotsrhythmus Modul: Part 1 will be offered every summer term, part 2 every winter term.

Aufnahmekapazität Modul: 30

Modullevel: MM (Mastermodul / Master module)

Modulart: Wahlpflicht / Elective

Lern-/Lehrform / Type of program: Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)

Vorkenntnisse / Previous knowledge:

Prüfung: Prüfungszeiten: Prüfungstform: last class in summer term

The module will be evaluated with a written exam of...
| Prüfung | Prüfungszeiten | Prüfungsf \r
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<td>2 hours duration. Bonus for a presentation (speech) and participation in discussions on other presentations in the seminar.</td>
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<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzeit</th>
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<tr>
<td>Vorlesung</td>
<td>2.00</td>
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<td>SoSe</td>
<td>28 h</td>
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<tr>
<td>Seminar</td>
<td>2.00</td>
<td></td>
<td>WiSe</td>
<td>28 h</td>
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**Präsenzzeit Modul insgesamt**

56 h
### psy220 - Human Computer Interaction

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Human Computer Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy220</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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<tr>
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<td>Modulverantwortung</td>
</tr>
<tr>
<td></td>
<td>Jochem Rieger</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master's programme Neurocognitive Psychology or other programs related to the field (e.g. neuroscience, computer science, physics etc.).</td>
</tr>
</tbody>
</table>

#### Kompetenzziele

**Goals of module:**

The goal of the module is to provide students with basic skills required to plan, implement and evaluate devices for human computer interaction. As a specific goal the module works toward the implementation of a brain computer interface (BCI). BCIs are ideal showcases as they fully span the interdisciplinary field of HCI design, implementation and evaluation.

**Competencies:**

- Neuropsychological / neurophysiological knowledge
- Interdisciplinary knowledge & thinking
- Experimental methods
- Statistics & scientific programming
- Critical & analytical thinking
- Scientific communication skills
- Knowledge transfer
- Group work
- Project & time management

#### Modulinhalte

In this module we will address human computer interaction (HCI) in its interdisciplinary requirements focusing on the perspective from neurocognitive psychology. The students learn core concepts in Human Computer Interaction plus data recording and analysis techniques related to Brain Machine Interfacing.

**Part 1: Foundations of HCI and BCI (lecture)**

- Human information processing and models of human cognition (Perception, attention, memory, emotion and individual differences)
- Computer interfaces for interaction
- Data analysis techniques for brain machine interfacing (time series analysis, feature selection, classification)
- Evaluation techniques

**Part 2: HCI and BCI in practice (practical course)**

The second part of the module builds upon the theoretical concepts elaborated in the first. We will work through recent applications published in the literature and, where applicable, implement parts of a BCI-system and conduct experiments.

#### Literatureempfehlungen

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

#### Links

- Unterrichtssprache: Englisch
- Dauer in Semestern: 2 Semester
- Angebotsrhythmus Modul: The module will be offered every summer term.
- Aufnahmekapazität Modul: 15
- Hinweise: We strongly recommend to take either psy170, psy270, psy275, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!
- Modullevel: MM (Mastermodul / Master module)
- Modulart: Wahlpflicht / Elective
- Lern-/Lehrform / Type of program: Part 1: lecture; Part 2: practical course
- Vorkenntnisse / Previous knowledge

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<table>
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<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
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<tr>
<td>Vorlesung</td>
<td>2.00</td>
<td></td>
<td>SoSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Theorie-Praxis-Seminare</td>
<td>2.00</td>
<td></td>
<td>SoSe</td>
<td>28 h</td>
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</table>

| Präsenzzeit Modul insgesamt | 56 h |


psy230 - Neuromodulation of Cognition

Modulbezeichnung: Neuromodulation of Cognition
Modulcode: psy230
Kreditpunkte: 6.0 KP
Workload: 180 h

Verwendet in Studiengängen:
- Master Neurocognitive Psychology > Mastermodule

Ansprechpartner/-in:
- Modulverantwortung: Jochem Rieger

Teilnahmevoraussetzungen:
Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.

Kompetenzziele: Goals of module:
The aim of this module is to provide students with a theoretical background on how cognitive functions can be altered via neuromodulation.

- Neuropsychological / neurophysiological knowledge
- interdisciplinary knowledge & thinking
- experimental methods
- ethics / good scientific practice / professional behavior
- critical & analytical thinking
- scientific communication skills

Modulinhalte:
Students will be introduced to the concepts of neuromodulation and the application of theoretical knowledge of neurophysiology to the modulation of cognitive functions.

**Part 1: Neuromodulation of cognition (lecture)**

- Neurotransmitter systems of cognition
- Neuropharmacological intervention
- Neuroenhancement
- Neurofeedback
- Neurostimulation

**Part 2: Neurofeedback (seminar)**

- Neurofeedback in control and therapy
- EEG-Neurofeedback
- EMG-Neurofeedback
- Transcranial magnetic stimulation
- Deep brain stimulation
- Patient safety

Literaturempfehlungen:

Links:
Unterrichtssprache: Englisch
Dauer in Semestern: 1 Semester

Die Module werden alle Wintersemester angeboten.

Aufnahmekapazität Modul: 15
Modullevel: MM (Mastermodul / Master module)
Modulart: Wahlpflicht / Elective

Lern-/Lehrform / Type of program: Part 1: lecture; Part 2: seminar

Vorkenntnisse / Previous knowledge

Prüfung
Prüfungszeiten
Prüfungsform
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<th>Prüfung</th>
<th>Prüfungszeiten</th>
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<tbody>
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<td>Gesamtmodul</td>
<td>during winter term</td>
<td>The module will be evaluated with an oral presentation in the seminar. Bonus for oral contribution.</td>
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<tr>
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<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
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<tr>
<td>Vorlesung</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
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<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
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| Präsenzzeit Modul insgesamt | |
|------------------------------| 56 h |
### psy241 - Computation in Neuroscience

<table>
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<th>Computation in Neuroscience</th>
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<tr>
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<tr>
<td>Kreditpunkte</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Verwendet in Studiengängen</td>
<td>• Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Modulverantwortung</td>
</tr>
<tr>
<td></td>
<td>» Johannes Voßkuhl</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
</tbody>
</table>
| Kompetenzziele                   | Goals of module: Students will acquire scientific programming skills as well as specific knowledge of computational methods in neuroscience and cognition. They will learn to judge the appropriateness and complexity of computational problems and solutions. Competencies:  
+ Neuropsychological / neurophysiological knowledge  
+ experimental methods  
++ statistics & scientific programming  
+ critical & analytical thinking  
+ knowledge transfer  
+ group work |
| Modulinhalte                     | Part 1: Introduction to scientific programming I (theoretical-practical seminar)  
  - Basic data types and structures  
  - Flow control (conditions, loops, errors)  
  - Testing and debugging  
  - Functions  

  Part 2: Introduction to scientific programming II (theoretical-practical seminar)  
  - Classes and objects  
  - Parallel processing  
  - Frequency analysis methods  
  - EEG processing  

  Part 3: Scientific programming I (exercise)  
  - Implementation of examples from part 1  

  Part 4: Scientific programming II (exercise)  
  - Implementation of examples from part 2  

| Literaturempfehlungen            | Mathworks (2009): MATLAB online documentation  

<table>
<thead>
<tr>
<th>Links</th>
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<tbody>
<tr>
<td>Unterrichtssprache</td>
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<td>Dauer in Semestern</td>
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<tr>
<td>Angebotsrhythmus Modul</td>
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<td>Aufnahmekapazität Modul</td>
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<tr>
<td>Modullevel</td>
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<td>Modulart</td>
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<tr>
<td>Lern-/Lehrform / Type of program</td>
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</table>
The participants will have to independently develop and program a solution for a given neuroscientific problem. Both the written code as well as the documentation of the approach taken will be assessed. Bonus for regularly handing in a total of 12 programming exercises.

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
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<tr>
<td>Theorie-Praxis-Seminare</td>
<td>2 semester hours per week for winter and summer term</td>
<td>4.00</td>
<td>SoSe und WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Übung</td>
<td>1 semester hour per week for winter and summer term</td>
<td>2.00</td>
<td>SoSe und WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Tutorium</td>
<td>2 semester hours per week in winter and summer term</td>
<td>0.00</td>
<td>SoSe und WiSe</td>
<td>0 h</td>
</tr>
</tbody>
</table>

| Präsenzzeit Modul insgesamt | 84 h |

Vorkenntnisse / Previous knowledge

**Prüfung**
- Gesamtmodul: exam period at the end of the summer term

**Prüfungszeiten**
- The participants will have to independently develop and program a solution for a given neuroscientific problem. Both the written code as well as the documentation of the approach taken will be assessed. Bonus for regularly handing in a total of 12 programming exercises.

**Lehrveranstaltungsform**
- Theorie-Praxis-Seminare: 2 semester hours per week for winter and summer term
- Übung: 1 semester hour per week for winter and summer term
- Tutorium: 2 semester hours per week in winter and summer term

**Kommentar**

**SWS**
- Theorie-Praxis-Seminare: 4.00
- Übung: 2.00
- Tutorium: 0.00

**Angebotsrhythmus**
- SoSe und WiSe

**Workload Präsenzzeit**
- Theorie-Praxis-Seminare: 56 h
- Übung: 28 h
- Tutorium: 0 h

**Präsenzzeit Modul insgesamt**
- 84 h
Psy250 - Internship

Module designation: Internship

Module code: psy250

Credit points: 15.0 KP

Workload: 450 h

Used in study programs:
- Master Neurocognitive Psychology > Mastermodule

Contact person:
- Modulverantwortung
  - Cornelia Kranczioch-Debener

Enrollment requirements:
- Enrolment in Master's programme Neurocognitive Psychology.

Competences:
- ++ expert neuropsychological/neurophysiological knowledge
- + interdisciplinary knowledge & thinking
- + experimental methods
- ++ ethics / good scientific practice / professional behavior
- ++ knowledge transfer
- + 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.

Recommended literature:

Languages:
- English, German

Duration in semesters:
- 1 Semester

Course frequency:
- Irregular

Module capacity:
- Unlimited

Notes:
The internship lasts 450 hours (12 weeks). It can be performed at 2 different institutions with a minimum duration of 150 hours (4 weeks) for each part. Your supervisor must be a psychologist.

Please note that details are regulated in the exam regulations.
A blank internship certificate can be found on the programme website.

Module level:
- MM (Mastermodul / Master module)

Module type:
- Pflicht / Mandatory

Learning/Teaching format:
- Internship at (external) institution

Previous knowledge:

Examination:
- Prüfung: 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.

Course attendance:
- Praktikum

SWS:
- 0.00

Course frequency:
- SoSe und WiSe

Workload participation:
- 0 h (450 h attendance at internship institution)
psy260 - Practical project

**Modulbezeichnung**
Practical project

**Modulcode**
psy260

**Kreditpunkte**
9.0 KP

**Workload**
270 h
(attendance in the lab as necessary for your project (~ 200h))

**Verwendet in Studiengängen**
- Master Neurocognitive Psychology > Mastermodule

**Ansprechpartner/-in**

- Jochem Rieger
- Christoph Siegfried Herrmann
- Stefan Debener
- Jalenur Özyurt
- Andrea Hildebrandt

**Modulberatung**

- Riklef Weerda

**Teilnehmervoraussetzungen**
Enrolment in Master's programme Neurocognitive Psychology.

**Kompetenzziele**
Goals of module:
Students will learn to plan, perform and analyse a study in the field of neurocognition. They will need to apply statistical knowledge and programming competencies to the data acquisition and analysis of data. Results will be related to the current neurocognitive literature and presented in a student poster symposium at the end of the module. Additionally, students should gain experience as participants in studies.

Competencies:
++ experimental methods
+ statistics & scientific programming
++ data presentation & discussion
+ independent research
+ scientific literature
+ ethics / good scientific practice / professional behavior
+ scientific communication skills
+ knowledge transfer
+ group work
++ project & time management

**Modulinhalte**
- The students develop an empirical investigation, carry it out and analyse the results.
- The students present and discuss their project in respect to recent literature in regular meetings and in a poster symposium.
- Students can develop an experimental design for a follow-up study which could potentially be the topic of their Master's thesis.
- As part of the practical project, students should participate in studies of other practical projects!

**Literaturempfehlungen**

**Links**
http://www.uni-oldenburg.de/en/psychology/study-programme/master/documents/

**Unterrichtssprache**
Englisch

**Dauer in Semestern**
1 Semester

**Angebotsrhythmus Modul**
The module will be offered every winter term.

**Aufnahmekapazität Modul**
unbegrenzt

Hinweise

Topics for projects will be presented in a colloquium at the end of the summer term.

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).
**Module level**  
MM (Mastermodul / Master module)

**Modulart**  
Pflicht / Mandatory

**Lern-Lehrform / Type of program**  
practical work and regular seminar meetings in the group where the project is performed

**Vorkenntnisse / Previous knowledge**  
PLEASE NOTE:

Many projects require knowledge of either EEG, fMRI, TBS, or HCI analysis! We strongly recommend to take either psy170: Neurophysiology, psy270/275: fMRI Data Analysis, psy280: Transcranial Brain Stimulation, or psy220 Human Computer Interaction prior to the practical project.

It is expected that students show basic knowledge of Matlab programming before starting the practical project.

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>usually end of April</td>
<td>Poster presentation in a student symposium (30% of the grade) and daily project work (70% of the grade).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminar</td>
<td>Please select the group in which you perform your practical project.</td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Praktikum</td>
<td>attendance as necessary for your project (~ 200h)</td>
<td>0.00</td>
<td>WiSe</td>
<td>0 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Präsenzzzeit Modul insgesamt</th>
<th>28 h</th>
</tr>
</thead>
</table>
### psy270 - Functional MRI Data Analysis

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Functional MRI Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy270</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td>Verwendet in Stuendiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
</tbody>
</table>

**Ansprechpartner/-in**

- Modulverantwortung
  - Carsten Gießing

**Teilnahmevoraussetzungen**

Enrolment in Master's programme Neurocognitive Psychology.

**Kompetenzziele**

Goals of module:

Students will learn the basics about planning and performing a neuroimaging study. They will focus on the statistical and methodological background of functional neuroimaging data analysis and analyse a sample functional MRI data set.

Competencies:

- ++ experimental methods
- ++ statistics & scientific programming
- + data presentation & discussion
- ++ group work

**Modulinhalte**

**Part 1:** Functional MRI data analysis (lecture)

**Part 2:** Planning, performance and analysis of functional neuroimaging studies using MATLAB-based software (seminar)

**Part 3:** Hands-on fMRI data analysis with SPM (practical course)

**Literaturrempfehlungen**


**Links**

- Unterrichtssprache: Englisch
- Dauer in Semestern: 1 Semester
- Angebotsrhythmus Modul: The module will be offered every summer term.
- Aufnahmekapazität Modul: 15 (The remaining places are reserved for Biology and Neuroscience students.)

**Hinweise**

Since the module is primarily offered for the Master's programme Biology it has to be offered as a blocked course. Please contact us if you are interested in the module but have problems with interfering other courses.

PLEASE NOTE:

We strongly recommend to take either psy170, psy270, psy275, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!

**Modullevel**

MM (Mastermodul / Master module)

**Modulart**

Wahlpflicht / Elective

**Lern-Lehrform / Type of program**

Part 1: lecture; Part 2: seminar; Part 3: practical course

**Vorkenntnisse / Previous knowledge**

Prüfung | Prüfungszeiten | Prüfungsf orm |
---|---|---|
Gesammodul | end of summer term | Oral or written examination |
  | | Bonus for active participation (e.g. presentations, creating study material for other participants, tandem learning or oral contributions) |

**Lehrveranstaltungsform**

<table>
<thead>
<tr>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vorlesung</td>
<td>2.00</td>
<td>SoSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Lehrveranstaltungsform</td>
<td>Kommentar</td>
<td>SWS</td>
<td>Angebotsrhythmus</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------</td>
<td>-----</td>
<td>------------------</td>
</tr>
<tr>
<td>Praktikum</td>
<td></td>
<td>4.00</td>
<td>SoSe</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>1.00</td>
<td>SoSe</td>
</tr>
<tr>
<td><strong>Präsenzzeit Modul insgesamt</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**psy275 - Essentials of fMRI Data Analysis with SPM and FSL**

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Essentials of fMRI Data Analysis with SPM and FSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy275</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h (Attendance: 56 h. (4 SWS), reading and practising: 124 h., total: 180 h.)</td>
</tr>
<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Modulverantwortung</td>
</tr>
<tr>
<td></td>
<td>• Riklef Weerda</td>
</tr>
<tr>
<td></td>
<td>• Peter Sörös</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master’s programme Neurocognitive Psychology, 3rd semester or higher.</td>
</tr>
</tbody>
</table>

**Kompetenzziele**

- Neuropsychological / neurophysiological knowledge
- Interdisciplinary knowledge & thinking
- Experimental methods
- Statistics & scientific programming
- Data presentation & discussion
- Independent research
- Scientific literature
- Ethics / good scientific practice / professional behaviour
- Critical & analytical thinking
- Group work

This module offers a concise introduction to the basic principles of functional magnetic resonance imaging (fMRI). Students will gain essential knowledge about experimental design, data collection and analysis. Special emphasis will be laid on the statistical background of fMRI data analysis and a hands-on introduction to SPM and FSL, two widely-used and free software packages for fMRI data analysis and results visualisation.

**Modulinhalte**

1. Methodological basics of functional magnetic resonance imaging (fMRI)
2. Basic principles of fMRI experimental design and data collection
3. Statistical background of fMRI data analysis
4. Hands-on training in fMRI data analysis and results visualisation with SPM and FSL

**Literaturempfehlungen**


**Links**

**Unterrichtssprache**

- Englisch

**Dauer in Semestern**

- 1 Semester

**Angebotsrhythmus Modul**

- The module will be offered in the winter term, blocked in the first half (seven weeks).

**Aufnahmekapazität Modul**

- 20

**Hinweise**

- PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy275, psy280, or psy220 to gain methodological competences (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master’s theses!

**Modullevel**

- MM (Mastermodul / Master module)

**Modulart**

- Wahlpflicht / Elective

**Lern-/Lehrform / Type of program**

- Part 1: 1 seminar (1 SWS)
- Part 2: 1 supervised exercise (3 SWS)

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>end of winter term</td>
<td>written exam</td>
</tr>
</tbody>
</table>

**Lehrveranstaltungsform**

| Seminar | 1.00 | WiSe | 14 h |
| Übung   | 3.00 | WiSe | 42 h |

**Präsenzzeit Modul insgesamt**

- 56 h
psy280 - Transcranial Brain Stimulation

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Transcranial Brain Stimulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy280</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Modulverantwortung</td>
</tr>
<tr>
<td></td>
<td>Christoph Siegfried Herrmann</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master’s programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Kompetenzziele</td>
<td>Goals of module:</td>
</tr>
<tr>
<td></td>
<td>Students will gain theoretical and practical knowledge on various non-invasive brain stimulation techniques.</td>
</tr>
<tr>
<td></td>
<td>Competencies:</td>
</tr>
<tr>
<td></td>
<td>++ Neuropsychological / neurophysiological knowledge</td>
</tr>
<tr>
<td></td>
<td>++ experimental methods</td>
</tr>
<tr>
<td></td>
<td>+ statistics &amp; scientific programming</td>
</tr>
<tr>
<td></td>
<td>+ scientific literature</td>
</tr>
<tr>
<td></td>
<td>+ ethics / good scientific practice / professional behaviour</td>
</tr>
</tbody>
</table>

**Modulinhalte**

In this module, we will introduce the theoretical concepts, neurophysiological underpinnings and neurocognitive as well as clinical applications of various non-invasive brain stimulation techniques such as transcranial magnetic stimulation (TMS), transcranial direct current stimulation (tDCS), transcranial alternating current stimulation (tACS), and transcranial random noise stimulation (tRNS). A focus will be tACS, because it is especially suited to modulate brain oscillations which have been shown to correlate with cognitive processes.

**Part 1: Introduction to transcranial brain stimulation (lecture)**

- Historical overview of brain stimulation
- Different techniques (TMS, IDCS, IACS, IRNS)
- Physiological mechanisms (entrainment, after-effects etc.)
- The use of transcranial brain stimulation in cognitive neuroscience
- Experimental parameters (intensity, electrode montage, etc.)
- Pros and cons of TMS vs. tACS
- Technical aspects (artefact correction, modelling current flow, etc.)
- Safety issues
- Ethical considerations of brain stimulation

**Part 2: Effects of IACS on physiology and cognition (seminar)**

- Physiology of IACS (on-line and after-effects)
- Modulating cognitive functions (e.g. memory, attention, and perception)
- Clinical applications of IACS
- Hands-on experience in the lab

**Literaturempfehlungen**


**Links**

<table>
<thead>
<tr>
<th>Unterrichtssprache</th>
<th>Englisch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dauer in Semestern</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Angebotsrhythmus Modul</td>
<td>The module will be offered every summer term.</td>
</tr>
<tr>
<td>Aufnahmekapazität Modul</td>
<td>10</td>
</tr>
<tr>
<td>Hinweise</td>
<td>We strongly recommend to take either psy170, psy270, psy275, psy280, or psy220 to gain methodological competencies (EEG, IMRI, TBS, HCI) that are needed for most practical projects and Master’s thesis!</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: seminar</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Prüfung</td>
<td>Prüfungszeiten</td>
</tr>
<tr>
<td>---------</td>
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</tr>
<tr>
<td>Gesammodul</td>
<td>during summer term</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vorlesung</td>
<td>2.00</td>
<td></td>
<td>SoSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>2.00</td>
<td></td>
<td>SoSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

| Präsenzzeit Modul insgesamt | 56 h |
Abschlussmodul

mam - Masterabschlussmodul

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Masterabschlussmodul</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>mam</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>30.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>900 h</td>
</tr>
<tr>
<td></td>
<td>(attendance in the lab meetings: 28h (2 SWS); thesis work: 872 hours)</td>
</tr>
</tbody>
</table>

Verwendet in Studiengängen
- Master Neurocognitive Psychology > Abschlussmodul

Ansprechpartner/-in

Teilnahmevoraussetzungen
- Enrolment in Master's programme Neurocognitive Psychology.
- Completion of at least 60 credit points in other modules including module psy241.
- Assignment of a topic by first thesis supervisor and official application with the examination office.

Kompetenzziele
- Goals of module:
  - Students will demonstrate that they are able to perform a (neuro)psychological experiment according to scientific standards. In addition, they will demonstrate that they are acquainted with the necessary methods and can present their results orally and in written form.

  Competencies:
  - ++ experimental methods
  - + statistics & scientific programming
  - + data presentation & discussion
  - ++ independent research
  - + scientific literature
  - ++ scientific English / writing
  - + ethics / good scientific practice / professional behavior
  - + critical & analytical thinking
  - + scientific communication skills
  - + knowledge transfer
  - ++ project & time management

Modulinhalte

Part 1: Master's thesis
- The students work on a given topic in cognitive neuroscience using literature research and the appropriate experimental methods.

Part 2: Master's colloquium
- The preparation of the thesis is accompanied by regular participation in the lab meetings of the groups in which the thesis is performed. Students present their study design at the beginning of their thesis preparation and their results towards the end. In addition, they listen to the presentations of the other lab members and students in the group.

Literaturempfehlungen

Links
- Rules for external Master's theses are explained here: http://www.uni-oldenburg.de/en/psychology/study-programme/master/documents/

Unterrichtssprache
- Englisch

Dauer in Semestern
- 1 Semester

Angebotsrhythmus Modul
- irregular

Aufnahmekapazität Modul
- unbegrenzt

Hinweise
- If you want to do a Master's thesis outside the Department of Psychology, please follow the rules stated on the program website.

Modullevel
- Abschlussmodul (Abschlussmodul / Conclude)

Modulart
- Pflicht / Mandatory

Lern-/Lehrform / Type of program
- individual thesis preparation with supervision

Vorkenntnisse / Previous knowledge
- contact your supervisor for details

Prüfung / Prüfungszeiten / Prüfungstform
- The written thesis will be evaluated by the supervisor and an additional reviewer (90%).
  - The oral presentation and defence of the thesis results will be evaluated (10%).

Lehrveranstaltungsform
- Seminar und Projekt

SWS
- 2.00

Angebotsrhythmus
- SoSe
| Workload Präsenzzzeit | 28 h  | (Attendance as required for your project and 2 hours per week for participating in the lab meetings.) |