**Modules for Neurocognitive Psychology**

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### Mastermodule

**psy111 - Research methods I - Statistical Modeling**

<table>
<thead>
<tr>
<th>Module label</th>
<th>Research methods I - Statistical Modeling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy111</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Applicability of the module</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
</tbody>
</table>

**Responsible persons**

- Hildebrandt, Andrea (Module responsibility)
- Hildebrandt, Andrea (Authorized examiners)

**Prerequisites**

Enrolment in Master's programme Neurocognitive Psychology.

**Skills to be acquired in this module**

**Goals of module:**
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.

**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

**Module contents**

**Part 1: Multivariate statistical modeling**

- Graphical representation of multivariate data
- The Generalized Linear Modeling (GLM) framework
- Multiple and moderated linear regression with quantitative and qualitative predictors
- Logistic regression models
- Multilevel regression (Generalized Linear Mixed Effects Modeling – GLMM)
- Non-linear regression models (Polynomial regression, regression splines and local regression)
- Path modeling
- Factor analysis (exploratory & confirmatory)
- Structural equation modeling (SEM; linear and non-linear)

**Part 2: Multivariate statistical modeling with R (seminar)**

- Data examples and applications of GLM, GLMM, polynomial, spline and local regression, path modeling, factor analyses and SEM

**Reader's advisory**

**Links**

- Language of instruction: English
- Duration (semesters): 1 Semester
- Module frequency: The module will start every winter term.
- Module capacity: unlimited
- Modullevel / module level: MM (Mastermodul / Master module)
- Modulart / typ of module: Pflicht / Mandatory
- Lehr-/Lernform / Teaching/Learning method: Parts 1: lecture; Parts 2: seminar; additional tutorials are offered.
- Vorkenntnisse / Previous knowledge: Solid knowledge in basic statistics; otherwise please attend Introductory Course Statistics
- Examination: Time of examination
- Type of examination

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<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>end of winter term</td>
<td>The module will be tested with a written exam.</td>
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<td></td>
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<td>Required active participation for gaining credits: attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).</td>
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<table>
<thead>
<tr>
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<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
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<td>Seminar</td>
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</tr>
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<td>Tutorial</td>
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**Total time of attendance for the module**: 56 h
# psy112 - Research methods II - Statistical Learning

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<tbody>
<tr>
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<td>psy112</td>
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<tr>
<td>Credit points</td>
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<td>Responsible persons</td>
<td>Hildebrandt, Andrea (Module responsibility)</td>
</tr>
<tr>
<td></td>
<td>Hildebrandt, Andrea (Authorized examiners)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td>Goals of module: 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.</td>
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<tr>
<td></td>
<td>Competencies:</td>
</tr>
<tr>
<td></td>
<td>++ interdisciplinary knowledge &amp; thinking</td>
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<tr>
<td></td>
<td>++ statistics &amp; scientific programming</td>
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<tr>
<td></td>
<td>++ data presentation &amp; discussion</td>
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<td></td>
<td>+ independent research</td>
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<td></td>
<td>+ scientific literature</td>
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<tr>
<td></td>
<td>++ ethics / good scientific practice / professional behavior</td>
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<tr>
<td></td>
<td>++ critical &amp; analytical thinking</td>
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<td></td>
<td>++ scientific communication skills</td>
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<td></td>
<td>+ group work</td>
</tr>
<tr>
<td>Module contents</td>
<td>Part 1: Statistical / machine learning methods</td>
</tr>
<tr>
<td></td>
<td>* Supervised and unsupervised statistical learning and prediction</td>
</tr>
<tr>
<td></td>
<td>* Resampling methods</td>
</tr>
<tr>
<td></td>
<td>* Regularized regression</td>
</tr>
<tr>
<td></td>
<td>* Linear and quadratic discriminant analysis</td>
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<tr>
<td></td>
<td>* Naive Bayes algorithm</td>
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<td></td>
<td>* Tree-based methods</td>
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<td></td>
<td>* Support vector machines</td>
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<tr>
<td></td>
<td>* The basics of neural networks</td>
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<tr>
<td></td>
<td>* Principal component regression</td>
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<td></td>
<td>* Clustering methods</td>
</tr>
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<td></td>
<td>Part 2: Statistical / machine learning methods with R (voluntary seminar)</td>
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<tr>
<td></td>
<td>* Data examples and applications of the basic machine learning methods covered in the lecture</td>
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<tr>
<td></td>
<td>Part 3: Evaluation research (seminar)</td>
</tr>
<tr>
<td></td>
<td>* Paradigms and methods in applied evaluation research (quantitative, mixed-methods)</td>
</tr>
<tr>
<td></td>
<td>* Types of studies and designs in evaluation research (experimental, quasi-experimental, (multiple) time series, etc.)</td>
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<tr>
<td></td>
<td>* Multivariate statistical modeling of change over time and group differences in change</td>
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<td></td>
<td>* Specific statistical tools for sampling and matching (e.g., Propensity score matching)</td>
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<td></td>
<td>* Basics of causality theory and the estimation of average and conditional effects in EffectLiteR</td>
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<td></td>
<td>* Research synthesis and meta-analysis</td>
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<tr>
<td>Reader's advisory</td>
<td></td>
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<td>Links</td>
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<td>Language of instruction</td>
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<td>Duration (semesters)</td>
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<td>Module frequency</td>
<td>The module will start every summer term.</td>
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<td>MM (Mastermodul / Master module)</td>
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<tr>
<td>Module level / module level</td>
<td></td>
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<tr>
<td>Modulart / typ of module</td>
<td>Pflicht / Mandatory</td>
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<tr>
<td>Lehr-/Lernform / Teaching/Learning method</td>
<td>Part 1: lecture; Parts 2 and 3: seminars; additional tutorials are offered.</td>
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<td>Vorkenntnisse / Previous knowledge</td>
<td>psy 111 Research methods I – Statistical Modeling</td>
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<tr>
<td>Final exam of module</td>
<td>end of summer term</td>
<td>The module will be tested with an oral exam (25 min). Required active participation for gaining credits: attendance of at least 70% in the mandatory seminar (use attendance sheet that will be handed out in the beginning of the term).</td>
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<th>Frequency</th>
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<td>Seminar</td>
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<td>SuSe</td>
<td>28</td>
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<tr>
<td>Tutorial</td>
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| Total time of attendance for the module | 56 h |
psy121 - Psychological assessment and diagnostics

Module label | Psychological assessment and diagnostics
Module code | psy121
Credit points | 12.0 KP
Workload | 360 h
Applicability of the module | Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons
- Hildebrandt, Andrea (Module responsibility)
- Hildebrandt, Andrea (Authorized examiners)
- Hellmann, Andreas (Authorized examiners)
- Debener, Stefan (Module counselling)

Prerequisites
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module

Goals of module:
Students will acquire specific knowledge about psychological assessment, test theory and test construction, and will be trained to utilize this knowledge within a research or test development 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 applied psychometrics 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 test and 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.

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

Module contents

Part 1: Introduction to Psychological Assessment (lecture): winter
- Psychological assessment as a decision process – descriptive and prescriptive models
- Introduction to test theories (will be detailed in Part 3)
- Assessment methods, their construction and design, quality criteria
- The logic of decision making in the assessment process
- Classificatory decisions
- Psychometrics to single cases
- Summarizing results and writing reports

Part 2: Test Theory and Test Construction (lecture): winter
- Classical test theory
- Generalizability theory
- Latent-State and Trait theory
- Latent variable models for different types of item responses
- Measurement invariance across groups and time
- Network modeling in psychometrics
- Preference modeling for constructing faking-resistant questionnaires and tests

Part 3: applied seminars: summer (choose a or b)
a: The Assessment Process Applied OR
- Case conceptualization (neuropsychology and clinical psychology)
- Formulating hypotheses
- Selecting assessment procedures and planning administration
- Deciding upon decision rules for data integration
- Evaluating the application of assessment procedures
- Analyzing, summarizing and visualizing results
- Integrating results based on the decision rules
- Writing a psychological/assessment report
- Discussing a report with the client
b: Test Construction Applied
- Construct conceptualization
- Deciding upon the response format
- Item mining
- Item analysis
- Test quality report and test manual

Part 4: Assessment in Clinical Neuropsychology (seminar): summer
- specific knowledge
- exercises in testing / practising tests

Reader’s advisory
Will be specified in the courses.

Links
Language of instruction
English

Duration (semesters)
2 Semester

Module frequency
The module will start every winter term.

Module capacity
unlimited

Modullevel / module level
MM (Mastermodul / Master module)

Modulart / typ of module
Pflicht / Mandatory

Lehr-/Lernform / Teaching/Learning method
Part 1 and 2: 2 lectures ; Part 3 and 4: seminars

Vorkenntnisse / Previous knowledge
You should know basic statistical concepts as they are also covered in the introductory course statistics. Multivariate statistics is a prerequisite for the psychometric track.

 Examination
Time of examination
Type of examination
Final exam of module
summer term
The module will be tested by a practical exercise (test application and protocol / test construction) 90% and an oral presentation of the planned contents 10%.

Required active participation for gaining credits:
- 2 presentations or test executions
- handing in 10 exercises
- participation in discussions on other presentations
- attendance of at least 70% in the seminars.

Course type
Comment
SWS
Frequency
Workload of compulsory attendance
Lecture
4
WiSe
56
Seminar
4
SuSe
56

Total time of attendance for the module
112 h
psy130 - Communication of scientific results

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<th>Communication of scientific results</th>
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<tr>
<td>Module code</td>
<td>psy130</td>
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<td>Credit points</td>
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<td>Workload</td>
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<td>Applicability of the module</td>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
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**Responsible persons**
- Herrmann, Christoph Siegfried (Module responsibility)
- Herrmann, Christoph Siegfried (Authorized examiners)
- Kasten, Florian (Authorized examiners)
- Strüber, Daniel (Authorized examiners)
- Strüber, Daniel (Module counselling)

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

**Skills to be acquired in this module**

**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

**Module contents**

**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

**Reader’s advisory**

**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 choose whether they want to attend the colloquium in the first, second or both semesters.

**Modullevel / module level**
MM (Mastermodule / Master module)

**Modulart / typ of module**
Pflicht / Mandatory

**Lehr-/Lernform / Teaching/Learning method**
Communication of scientific results: seminar; Psychological colloquium: colloquium

**Vorkenntnisse / Previous knowledge**

**Examination**
- Time of examination
- Type of examination
- Oral presentation
  Required active participation for gaining credits: 70% attendance of the seminar and at least 8 colloquia (use attendance sheet that will be handed out in the beginning of the term) and active
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<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
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**Total time of attendance for the module**  56 h
psy141 - Minor

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<td>Workload</td>
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Applicability of the module

- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons

- Rieger, Jochem (Module counselling)
- Bleichner, Kerstin (Module counselling)

Prerequisites

Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module

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.

Competencies:

++ interdisciplinary knowledge & thinking

Module contents

Students can take Master modules and courses from the fields

- Biology
- Neurosciences
- Computer Science
- Physics
- Mathematics
- Pedagogy
- Philosophy
- related fields
- Psychology (additional elective module (NOT psy170, psy220, psy270, psy280) or from another study programme)

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

Upon approval, German-speaking students can attend a career-relevant language course (i.e. necessary for internship, practical project or Master's thesis). English classes cannot be taken as Minor.

A list of already approved courses/modules can be found on our website. You can take other courses/modules upon approval.

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

Reader's advisory

Links

List of approved courses/modules and approval form:
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

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)

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. You will receive a pass/fail for this module. You CANNOT use it afterwards as a normal
elective module. You can also NOT redeicate an elective that you have already started as your Minor.

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.

It is your responsibility to ask the teacher whether you can take part.

<table>
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<tr>
<th>Module level / module level</th>
<th>MM (Mastermodul / Master module)</th>
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<tbody>
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<td>Pflicht / Mandatory</td>
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<td>Lehr-/Lernform / Teaching/Learning method</td>
<td>Lectures and seminars (depends on the chosen modules)</td>
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<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
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<tr>
<td>Final exam of module</td>
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<td></td>
<td>If grades are earned in the minor, those are counted as pass/fail. Certificates for grades can be separately requested from the examination office.</td>
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<table>
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<tr>
<th>Course type</th>
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<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
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<tr>
<td>Workload attendance</td>
<td>56 h</td>
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psy150 - Clinical Psychology

Module label: Clinical Psychology
Module code: psy150
Credit points: 9.0 KP
Workload: 270 h

Applicability of the module:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons:
- Thiel, Christiane Margarete (Module responsibility)
- Thiel, Christiane Margarete (Authorized examiners)

Prerequisites:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:

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

Module contents:
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): winter
Basics of neurotransmitter systems and psychopharmacology
Substance Abuse (e.g. psychostimulants, hallucinogenics)
Depression
Anxiety Disorders
Alzheimer's Disease
Schizophrenia
psychopathological assessment

The seminar will be given in German as clinicians and patient actors are involved.

Part 2: Psychological interventions within the framework of evidence-based medicine (seminar): summer
(partly in German): Concepts of evidence based treatment and treatment of acquired dysfunctions of the brain
treatment studies of selected psychiatric disorders

Reader's advisory:
- Selected papers (part 2)

Links:
Languages of instruction: English, German
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<tr>
<th><strong>Duration (semesters)</strong></th>
<th>2 Semester</th>
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<tbody>
<tr>
<td><strong>Module frequency</strong></td>
<td>Part 1 will be offered every winter term, part 2 every summer term.</td>
</tr>
<tr>
<td><strong>Module capacity</strong></td>
<td>unlimited</td>
</tr>
<tr>
<td><strong>Reference text</strong></td>
<td>Please note: Parts of this module that teach clinical contents will be taught in German (partly with accompanying English materials). To follow all parts of this module, students need to be able to follow a lecture in German. Presentations can be given in English.</td>
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<td><strong>Modullevel / module level</strong></td>
<td>MM (Mastermodul / Master module)</td>
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<td><strong>Modulart / type of module</strong></td>
<td>Wahlpflicht / Elective</td>
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<tr>
<td><strong>Lehr-/Lernform / Teaching/Learning method</strong></td>
<td>Part 1: lecture and seminar; part 2: seminar</td>
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<td><strong>Examination</strong></td>
<td>Time of examination</td>
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psy170 - Neurophysiology

Module label: Neurophysiology
Module code: psy170
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons:
- Debener, Stefan (Module responsibility)
- Debener, Stefan (Authorized examiners)

Prerequisites:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:

**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

Module contents:

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): winter**
- Neurophysiology, EEG, EMG, ECG
- Neuroanatomy
- Time-domain and frequency-domain analysis methods

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

**Part 3: EEG analysis with Matlab (seminar): summer**
- 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

Reader's advisory:


Links:

- Language of instruction: English
- Duration (semesters): 2 Semester
- Module frequency: The module will start every winter term.
**Module capacity** | 18 (The lecture is not restricted.)
---|---
**Reference text** | PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master’s theses!
---|---
**Modullevel / module level** | MM (Mastermodul / Master module)
---|---
**Modulart / typ of module** | Wahlpflicht / Elective
---|---
**Lehr-/Lernform / Teaching/Learning method** | Part 1: lecture; Part 2 and 3: seminars
---|---
**Vorkenntnisse / Previous knowledge** | Time of examination 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. Required active participation for gaining credits: recording of electroencephalographic data attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).
---|---
**Course type** | 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. 2 semester hours per week in summer term. | 3 | SoSe und WiSe | 42
---|---|---|---|---
**Total time of attendance for the module** | 56 h
psy181 - Neurocognition

Module label                      Neurocognition
Module code                      psy181
Credit points                    6.0 KP
Workload                         180 h
Applicability of the module      • Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Responsible persons              Thiel, Christiane Margarete (Module responsibility)
                                    Thiel, Christiane Margarete (Authorized examiners)
Prerequisites                     Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module

Goals of module:
Students should be able to recognize and critically evaluate the value of considering neuroscience in the study of psychological topics.

Competencies:
++ neuropsychological / neurophysiological knowledge
++ interdisciplinary knowledge & thinking
++ data presentation & discussion
++ scientific literature
+ scientific communication skills
+ group work

Module contents

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).

Part 1: Introduction to cognitive neuroscience (lecture and seminar): winter
Brain and cognition, methods of cognitive neuroscience
Attention, learning and memory
Emotional and social behaviour
Language, executive functions

Part 2: Neurocognitive development (seminar): summer
Brain development and cortical plasticity
Effects of early-life stress on brain development
Development of object recognition, social cognition, memory, and executive functions

Reader's advisory


Links
Language of instruction           English
Duration (semesters)              2 Semester
Module frequency                 The module will be offered every winter term.
Module capacity                  20 (Part 1 (lecture and seminar) are unrestricted, part 2 is restricted to 20 students.)
Modullevel / module level         MM (Mastermodul / Master module)
Modulart. / typ of module         Wahlpflicht / Elective
### Lehr-/Lernform / Teaching/Learning method

Part 1: lecture and seminar; Part 2: seminar

### Vorkenntnisse / Previous knowledge

<table>
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<tr>
<th>Examination</th>
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<th>Type of examination</th>
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<tr>
<td>Final exam of module</td>
<td>mid-February</td>
<td>The module will be tested with a written electronic exam of 2 h duration on the contents of part 1. Required active participation for gaining credits: 1 presentation participation in discussions on other presentations attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).</td>
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<table>
<thead>
<tr>
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<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
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<tr>
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<td>Seminar</td>
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**Total time of attendance for the module**: 56 h
psy190 - Sex and Cognition

Module label: Sex and Cognition
Module code: psy190
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons:
- Strüber, Daniel (Module responsibility)
- Strüber, Daniel (Authorized examiners)

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:
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

Module contents:

Part 1: Introduction to the study of sex differences (lecture): winter
- 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): winter
- 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

Reader’s advisory:

Links:

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<table>
<thead>
<tr>
<th><strong>Language of instruction</strong></th>
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<tr>
<td><strong>Duration (semesters)</strong></td>
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<td><strong>Module frequency</strong></td>
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<td><strong>Module level / module level</strong></td>
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<td><strong>Modulart / typ of module</strong></td>
<td>Wahlpflicht / Elective</td>
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<td><strong>Lehr-/Lernform / Teaching/Learning method</strong></td>
<td>Part 1: lecture; Part 2: seminar</td>
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### Vorkenntnisse / Previous knowledge

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<td>oral presentation</td>
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Required active participation for gaining credits: participation in discussions on other presentations, attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).

### Course type

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<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
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<td>Seminar</td>
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<td>2</td>
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<td>28</td>
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**Total time of attendance for the module**: 56 h
psy201 - Neuropsychology

Module label: Neuropsychology
Module code: psy201
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons:
- Debener, Stefan (Module responsibility)
- Debener, Stefan (Authorized examiners)

Prerequisites:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module

Goals of module:
Students will learn to understand changes in thinking and behaviour that may arise from brain dysfunctions (part 1, 3), 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).

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

Module contents

Part 1: Introduction to Clinical Neuropsychology (lecture): winter
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): summer
Behavioural and neuropsychological approaches
neurofeedback in neurorehabilitation and ADHD
memory rehabilitation
effects of physical activity on cognition
motor recovery

Part 3: Topics in Clinical Neuropsychology (seminar; taught partly in German): winter
Clinical neuroanatomy
Neurodegenerative diseases
Dementia

Choose either part 2 or part 3!

Reader's advisory

Links
Language of instruction: English
Duration (semesters): 1-2 Semester
Module frequency: The module will start every winter term.
Module capacity: 30 (Part 3 is not restricted.)
Reference text: Part 1 (lecture) is mandatory. Choose either part 2 or part 3 (seminars).
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.

Modullevel / module level: MM (Mastermodul / Master module)
Modulart / typ of module: Wahlpflicht / Elective
Lehr-/Lernform / Teaching/Learning method:
Part 1: lecture; Part 2: seminar; Part 3: seminar
### Vorkenntnisse / Previous knowledge

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<th>Type of examination</th>
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<td><strong>Final exam of module</strong></td>
<td>exam period at the end of winter term</td>
<td>The module will be tested with a written exam of 2 h duration.</td>
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<td>Required active participation for gaining credits: presentation participation in discussions on other presentations attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).</td>
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<td>WiSe</td>
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<td>Seminar</td>
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**Total time of attendance for the module**  56 h
psy210 - Applied Cognitive Psychology

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<td>Credit points</td>
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<td>Workload</td>
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<td>Applicability of the module</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
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### Responsible persons
- Rieger, Jochem (Module responsibility)
- Rieger, Jochem (Authorized examiners)
- Unni, Anirudh (Authorized examiners)

### 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:**
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

### Module contents
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 in to 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): summer**
- 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): winter**
In the accompanying seminar we will work through recent examples in the literature for topics of the lecture. The goal is to apply novel knowledge from the lecture to understand and critically discuss actual research approaches.

### Reader's advisory

### Links
- Language of instruction: English
- Duration (semesters): 2 Semester
<table>
<thead>
<tr>
<th><strong>Module frequency</strong></th>
<th>Part 1 will be offered every summer term, part 2 every winter term.</th>
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<tr>
<td><strong>Module capacity</strong></td>
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<tr>
<td><strong>Modullevel / module level</strong></td>
<td>MM (Mastermodul / Master module)</td>
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<tr>
<td><strong>Modulart / typ of module</strong></td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td><strong>Lehr-/Lernform / Teaching/Learning method</strong></td>
<td>Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)</td>
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<tr>
<td><strong>Vorkenntnisse / Previous knowledge</strong></td>
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<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
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</thead>
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<tr>
<td>Final exam of module</td>
<td>last class in summer term</td>
<td>The module will be evaluated with a written exam of 2 hours duration. Required active participation for gaining credits: 1-2 presentations participation in discussions on other presentations attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).</td>
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<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
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<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2</td>
<td>SuSe</td>
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<tr>
<td>Seminar</td>
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<td>2</td>
<td>WiSe</td>
<td>28</td>
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| Total time of attendance for the module | 56 h |
psy220 - Human Computer Interaction

<table>
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<th>Human Computer Interaction</th>
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<tr>
<td>Module code</td>
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<td>Credit points</td>
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<tr>
<td>Workload</td>
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<td>Applicability of the module</td>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
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<tr>
<td>Responsible persons</td>
<td>Rieger, Jochem (Module responsibility)</td>
</tr>
<tr>
<td></td>
<td>Rieger, Jochem (Authorized examiners)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Enrolment in Master's programme Neurocognitive Psychology or other programs related to the field (e.g. neuroscience, computer science, physics etc.).</td>
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</table>

Skills to be acquired in this module

**Goals of module:**
The goal of the module is to provide students with basic skills required to plan, implement and evaluate brain computer interfaces as devices for human computer interaction. BCIs are an ideal showcase as they fully span the interdisciplinary field of HCI design, implementation and evaluation. Moreover, BCI-techniques can be used for modern data-driven basic neuroscience.

The module combines a lecture on the theoretical foundations of the most important techniques with a seminar/hands on course in which students learn to implement the BCI-processing steps on real neurophysiological data and further elaborate specific subtopics.

**Competencies:**

++ Understanding of the foundations of statistical learning techniques
++ provide basics to understand technical time series processing and machine learning papers
++ interdisciplinary knowledge & thinking
++ experimental methods
++ statistics & scientific programming
++ critical & analytical thinking
++ scientific communication skills
++ knowledge transfer
++ group work
++ project & time management

Module contents

**Part 1: HCI and BCI Lecture: (Lecture on methodological foundations of BCI): summer**

**Part 2: Hands on BCI implementation (practical seminar): summer**

Topics covered:

- A brief history of BCIs and examples of HCI control and basic neuroscience using BCI techniques.
- Data preprocessing (e.g. filtering, projection techniques) and common artifacts and 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.

Reader's advisory

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

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

https://doi.org/10.3389/fsysn.2017.00061. (open access)
Signal processing:


PCA & SVD


Unsupervised feature Learning and deep learning tutorial:


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.


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

Links

Language of instruction  English
Duration (semesters)  1 Semester
Module frequency  The module will be offered every summer term.
Module capacity  15
Reference text  We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master’s theses!

Modulelevel / module level  MM (Mastermodul / Master module)
Modulart / typ of module  Wahlpflicht / Elective
Lehr-/Lernform / Teaching/Learning method  Part 1: lecture; Part 2: practical seminar
Vorkenntnisse / Previous knowledge  Basic programming skills, some high-school level maths

Examination  Time of examination  Type of examination
Final exam of module  last lecture in summer term  The module will be evaluated with an oral exam (max. 20 min). Required active participation for gaining credits: 1-2 presentations max. 24 programming exercises in the seminar participation in discussions on other presentations attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).

Course type  Comment  SWS  Frequency  Workload of compulsory attendance
Lecture  2  SuSe  28
Seminar  2  SuSe  28

Total time of attendance for the module  56 h
psy230 - Neuromodulation of Cognition

Module label: Neuromodulation of Cognition
Module code: psy230
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons:
- Rieger, Jochem (Module responsibility)
- Rieger, Jochem (Authorized examiners)

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

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

Module contents:
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): winter
- Neurotransmitter and neuromodulator systems
- Neuropharmacological intervention
- Mechanisms of neural plasticity
- Neurofeedback
- Electric and magnetic brain stimulation
- Therapeutical applications

Part 2: Topics in Neuromodulation (seminar): winter
- Psychological an therapeutical effects of neuromodulation
- Modulation of neuronal network function
- Deep brain stimulation for therapeutical modulation

Reader's advisory:


Links:
Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: The module will be offered every winter term.
Module capacity: 15
Modullevel / module level: MM (Mastermodul / Master module)
Modulart. / typ of module: Wahlpflicht / Elective
### Lehr-/Lernform / Teaching/Learning method

Part 1: lecture; Part 2: seminar

### Vorkenntnisse / Previous knowledge

<table>
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<tr>
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<td>Final exam of module</td>
<td>during winter term</td>
<td>Presentation 80% written test on the topics of the lecture 20% Required active participation for gaining credits: participation in discussions on other presentations attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).</td>
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### Course type

<table>
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<td>Lecture</td>
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<td>Seminar</td>
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<td>WiSe</td>
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### Total time of attendance for the module

56 h
psy240 - Computation in Neuroscience

Module label: Computation in Neuroscience
Module code: psy240
Credit points: 9.0 KP
Workload: 270 h
Applicability of the module: Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Responsible persons:
- Stecher, Heiko (Module responsibility)
- Stecher, Heiko (Authorized examiners)
Prerequisites:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:

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

Module contents:

Part 1: Introduction to scientific programming I (lecture): winter
- Basic data types and structures
- Flow control (conditions, loops, errors)
- Testing and debugging
- Functions

Part 2: Introduction to scientific programming II (lecture): summer
- Complex data structures
- EEG processing
- Frequency analysis methods
- Introduction to toolboxes

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

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

Part 5: Computer-controlled experimentation (seminar): summer
- Computer hardware basics
- Scripting and programming in Presentation
- Combining stimulus delivery with EEG
- Temporal precision

Reader's advisory:
- Mathworks (2009): MATLAB online documentation

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:**

Passing the exam of psy240 is mandatory for starting a Practical Project (psy260) and the Master's thesis.

### Module level / module level

MM (Mastermodul / Master module)

### Module art / typ of module

Pflicht / Mandatory

### Lehr-/Lernform / Teaching/Learning method

Part 1 and 2: lectures; Part 3 and 4: exercises; Part 5: seminar; additional tutorials

### Vorkenntnisse / Previous knowledge

### Examination

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<tr>
<td>exam period at the end of the summer term</td>
<td>In a 90-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. Required active participation for gaining credits: script for the presentation of experimental stimuli in part 5 attendance of at least 70% in the seminar 'Presentation', part 5 (use attendance sheet that will be handed out in the beginning of the term).</td>
</tr>
</tbody>
</table>

### Course type

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>4</td>
<td>SoSe und WSe</td>
<td>56</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2</td>
<td>SuSe</td>
<td>28</td>
</tr>
<tr>
<td>Exercises</td>
<td></td>
<td>2</td>
<td>SoSe und WSe</td>
<td>28</td>
</tr>
<tr>
<td>Tutorial</td>
<td></td>
<td></td>
<td>SoSe und WSe</td>
<td>0</td>
</tr>
</tbody>
</table>

### Total time of attendance for the module

112 h
Goals of module:
Students will obtain direct experience in the field of psychology. This includes being involved in the provision of psychological or neuropsychological services in real-life situations, such as neuropsychological testing or counselling in a hospital or mental health clinic, or conducting and contributing to psychological research. The internship should be chosen by the student such that it can provide a meaningful educational opportunity that will help students to decide on their preferred area of work.

Competencies:
++ 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.

Reader's advisory
The internship lasts 360 hours (9-10 weeks). It can be performed at 2 different institutions with a minimum duration of 150 hours (4 weeks) for each part.

A part of your internship (maximally 150 hours) can be performed internally in the Department of Psychology. Internal internships cannot be performed in the same lab in which you will perform / have performed your Practical Project psy260!

Your supervisor must be a psychologist. If your supervisor is NOT a psychologist, please contact us for approval BEFORE you start your internship.

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

To generate ideas, a folder with information on internships that other students have performed is available in the office of Dr. Cornelia Kranczioch.

Please note that, due to the Coronavirus pandemic, you have to hand in a risk assessment form before starting your internship. You can find this form in English or German in the list of supporting documents!
<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Final exam of module</strong></td>
<td>Individual; 2-3 possibilities per semester to present the internship to other students</td>
<td>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.</td>
</tr>
</tbody>
</table>

Course type: Practical training

**SWS**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>SoSe oder WiSe</th>
</tr>
</thead>
</table>

**Workload attendance**

| 0 h / 360 hours presence at internship institution |
psy260 - Practical project

<table>
<thead>
<tr>
<th>Module label</th>
<th>Practical project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy260</td>
</tr>
<tr>
<td>Credit points</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td></td>
<td>(attendance in the lab and accompanying seminars as necessary for your project (~ 200h) )</td>
</tr>
</tbody>
</table>

Applicability of the module
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons
- Debener, Stefan (Module responsibility)
- Herrmann, Christoph Siegfried (Module responsibility)
- Hildebrandt, Andrea (Module responsibility)
- Puschmann, Sebastian (Module responsibility)
- Rieger, Jochem (Module responsibility)
- Al-Zubaidi, Arkan (Authorized examiners)
- Bleichner, Martin Georg (Authorized examiners)
- Debener, Stefan (Authorized examiners)
- Gießing, Carsten (Authorized examiners)
- Hellmann, Andreas (Authorized examiners)
- Herrmann, Christoph Siegfried (Authorized examiners)
- Hildebrandt, Andrea (Authorized examiners)
- Hildebrandt, Helmut (Authorized examiners)
- Kasten, Florian (Authorized examiners)
- Kranczioch-Debener, Cornelia (Authorized examiners)
- Liu, Xinyang (Authorized examiners)
- Mirkovic, Bojana (Authorized examiners)
- Özyurt, Jale Nur (Authorized examiners)
- Rieger, Jochem (Authorized examiners)
- Stecher, Heiko (Authorized examiners)
- Strüber, Daniel (Authorized examiners)
- Thiel, Christiane Margarete (Authorized examiners)
- Unni, Anirudh (Authorized examiners)
- Meyer-Abich de Sousa Guerreiro, Maria (Authorized examiners)
- Puschmann, Sebastian (Authorized examiners)
- Blum, Sarah (Authorized examiners)
- Kaur, Yadwinder (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.
You can only start the practical project if you have passed the exam of psy240 (psy241) Computation in Neuroscience!
Priority is given to students with experience in methods used in the respective lab or students
who have taken the respective teaching modules.

Skills to be acquired in this module

**Goals of module:**

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 symposium.

**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

**Module contents**

- 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!

**Reader's advisory**

**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.

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).

Please note that, due to the Coronavirus pandemic, you have to hand in a risk assessment form before starting your external practical project. You can find this form in English or German in the list of supporting documents!

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

**Modulart / typ of module**  
Pflicht / Mandatory

**Lehr-/Lernform / Teaching/Learning method**  
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, IMRI, TBS, or HCI analysis! We strongly recommend to take either psy170: Neurophysiology, psy270: fMRI Data Analysis, psy280: Transcranial Brain Stimulation, or psy220 Human Computer Interaction prior to the practical project.

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**  
Time of examination  
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
<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminar</td>
<td>Please select the group in which you perform your practical project.</td>
<td>2</td>
<td>WiSe</td>
<td>28</td>
</tr>
<tr>
<td>Practical training</td>
<td>attendance as necessary for your project (~ 200h)</td>
<td></td>
<td>WiSe</td>
<td>0</td>
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</table>

**Total time of attendance for the module** 28 h
**psy270 - Functional MRI Data Analysis**

<table>
<thead>
<tr>
<th>Module label</th>
<th>Functional MRI Data Analysis</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy270</td>
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<tr>
<td>Credit points</td>
<td>9.0 KP</td>
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<tr>
<td>Workload</td>
<td>270 h</td>
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<tr>
<td>Applicability of the module</td>
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<tr>
<td>Master's Programme Biology (Master) &gt; Background Modules</td>
<td></td>
</tr>
<tr>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
<td></td>
</tr>
<tr>
<td>Master's Programme Neuroscience (Master) &gt; Background Modules</td>
<td></td>
</tr>
<tr>
<td>Responsible persons</td>
<td></td>
</tr>
<tr>
<td>Gießing, Carsten (Module responsibility)</td>
<td></td>
</tr>
<tr>
<td>Gießing, Carsten (Authorized examiners)</td>
<td></td>
</tr>
<tr>
<td>Prerequisites</td>
<td></td>
</tr>
<tr>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
<td></td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td></td>
</tr>
<tr>
<td>Goals of module:</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Competencies:</td>
<td></td>
</tr>
<tr>
<td>++ experimental methods</td>
<td></td>
</tr>
<tr>
<td>++ statistics &amp; scientific programming</td>
<td></td>
</tr>
<tr>
<td>+ data presentation &amp; discussion</td>
<td></td>
</tr>
<tr>
<td>++ group work</td>
<td></td>
</tr>
</tbody>
</table>

| Module contents                                  | Theoretical knowledge on functional MRI data analysis |
| Planning, performance and analysis of functional neuroimaging studies using MATLAB-based software |
| Hands-on fMRI data analysis with SPM             |

**Reader's advisory**


**Links**

<table>
<thead>
<tr>
<th>Language of instruction</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>The module will be offered every summer term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>15 (The remaining places are reserved for Biology and Neuroscience students.)</td>
</tr>
<tr>
<td>Reference text</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!</td>
</tr>
<tr>
<td>Modullevel / module level</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart / typ of module</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lehr-/Lernform / Teaching/Learning method</td>
<td>blocked course with lecture, interactive seminar and exercise parts</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>Students need to have solid statistical knowledge as taught in the Introductory Course Statistics and in</td>
</tr>
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</table>
### Research Methods

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Final exam of module</strong></td>
<td>end of summer term</td>
<td>Oral or written examination</td>
</tr>
</tbody>
</table>

Required active participation for gaining credits:
- 1-2 presentations
- participation in discussions on other presentations
- attendance of at least 70% in the seminars and exercises (use attendance sheet that will be handed out in the beginning of the term).

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2</td>
<td>SuSe</td>
<td>28</td>
</tr>
<tr>
<td>Exercises</td>
<td></td>
<td>2</td>
<td>SuSe</td>
<td>28</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>1</td>
<td>SuSe</td>
<td>14</td>
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</tbody>
</table>

**Total time of attendance for the module**

70 h
psy280 - Transcranial Brain Stimulation

Module label: Transcranial Brain Stimulation
Module code: psy280
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module: • Master’s Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons:
- Herrmann, Christoph Siegfried (Module responsibility)
- Herrmann, Christoph Siegfried (Authorized examiners)
- Strüber, Daniel (Authorized examiners)

Prerequisites: Enrolment in Master’s programme Neurocognitive Psychology.

Skills to be acquired in this module:

Goals of module:
Students will gain theoretical and practical knowledge on various non-invasive brain stimulation techniques.

Competencies:
++ Neuropsychological / neurophysiological knowledge
++ experimental methods
+ statistics & scientific programming
+ scientific literature
+ ethics / good scientific practice / professional behaviour

Module contents:

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): summer
- Historical overview of brain stimulation
- Different techniques (TMS, tDCS, tACS, tRNS)
- 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 (artifact correction, modelling current flow, etc.)
- Safety issues
- Ethical considerations of brain stimulation

Part 2: Effects of tACS on physiology and cognition (seminar): summer
- Physiology of tACS (on-line and after-effects)
- Modulating cognitive functions (e.g. memory, attention, and perception)
- Clinical applications of tACS
- Hands-on experience in the lab

Reader's advisory:


Links: 36 / 51
<table>
<thead>
<tr>
<th>Language of instruction</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>The module will be offered every summer term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>10</td>
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<tr>
<td>Reference text</td>
<td>We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's thesis!</td>
</tr>
<tr>
<td>Modul level / module level</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart / typ of module</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lehr-/Lernform / Teaching/Learning method</td>
<td>Part 1: lecture; Part 2: seminar</td>
</tr>
</tbody>
</table>

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>during summer term</td>
<td>Oral presentation in the seminar.</td>
</tr>
</tbody>
</table>

Required active participation for gaining credits: attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2</td>
<td>SuSe</td>
<td>28</td>
</tr>
<tr>
<td>Seminar</td>
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<td>2</td>
<td>SuSe</td>
<td>28</td>
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**Total time of attendance for the module** 56 h
<table>
<thead>
<tr>
<th>Module label</th>
<th>Study Abroad I - Psychology/Neuroscience</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy285</td>
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<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Applicability of the module</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Responsible persons</td>
<td>Department of Psychology (Module responsibility)</td>
</tr>
<tr>
<td></td>
<td>Bleichner, Kerstin (Module counselling)</td>
</tr>
<tr>
<td></td>
<td>Krancziuch-Debener, Cornelia (Module counselling)</td>
</tr>
<tr>
<td>Further responsible persons</td>
<td>Courses taken abroad will be approved by the examinations committee.</td>
</tr>
<tr>
<td>Prerequisites</td>
<td></td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td></td>
</tr>
<tr>
<td>Module contents</td>
<td>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.</td>
</tr>
<tr>
<td>Reader's advisory</td>
<td></td>
</tr>
<tr>
<td>Links</td>
<td></td>
</tr>
<tr>
<td>Language of instruction</td>
<td>English</td>
</tr>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td></td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
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<tr>
<td>Modullevel / module level</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart / typ of module</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lehr-/Lernform / Teaching/Learning method</td>
<td></td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>Time of examination</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>according to the regulations of the respective foreign university</td>
</tr>
<tr>
<td>Course type</td>
<td>Course selection (according to the regulations of the respective foreign university)</td>
</tr>
<tr>
<td>SWS</td>
<td>4</td>
</tr>
<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
</tr>
<tr>
<td>Workload attendance</td>
<td>56 h</td>
</tr>
</tbody>
</table>
### psy286 - Study Abroad II - Psychology/Neuroscience

<table>
<thead>
<tr>
<th>Module label</th>
<th>Study Abroad II - Psychology/Neuroscience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy286</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
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<tr>
<td>Applicability of the module</td>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Responsible persons</td>
<td>Department of Psychology (Module responsibility)</td>
</tr>
<tr>
<td></td>
<td>Kranczioch-Debener, Cornelia (Module counselling)</td>
</tr>
<tr>
<td></td>
<td>Bleichner, Kerstin (Module counselling)</td>
</tr>
<tr>
<td>Further responsible persons</td>
<td>Courses taken abroad will be approved by the examinations committee.</td>
</tr>
<tr>
<td>Prerequisites</td>
<td></td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td>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 or are still to be studied.</td>
</tr>
</tbody>
</table>

**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 or are still to be studied.

**Reader's advisory**

**Links**

**Language of instruction**

English

**Duration (semesters)**

1 Semester

**Module frequency**

**Module capacity**

unlimited

**Modullevel / module level**

MM (Mastermodul / Master module)

**Modulart / type of module**

Wahlpflicht / Elective

**Lehr-/Lernform / Teaching/Learning method**

**Vorkenntnisse / Previous knowledge**

**Examination**

Time of examination

Type of examination

Final exam of module according to the regulations of the respective foreign university

**Course type**

Course selection (according to the regulations of the respective foreign university)

**SWS**

4

**Frequency**

SoSe oder WiSe

**Workload attendance**

56 h
psy241 - Computation in Neuroscience

Module label: Computation in Neuroscience
Module code: psy241
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons:
- Stecher, Heiko (Module responsibility)
- Stecher, Heiko (Authorized examiners)

Prerequisites:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:
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

Module contents:

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 (excercise)
- Implementation of examples from part 1

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

Reader's advisory:
- Mathworks (2009): MATLAB online documentation

Links:

Language of instruction: English
Duration (semesters): 2 Semester
Module frequency: The module will be offered every winter term.
Module capacity: unlimited
Modulart / typ of module: Pflicht / Mandatory
Lehr-/Lernform / Teaching/Learning method: Part 1: theoretical-practical seminar; Part 2: theoretical-practical seminar; Part 3: excercise; Part 4: excercise; additional tutorials
### Vorkenntnisse / Previous knowledge

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>exam period at the end of the summer term</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory-practice seminars</td>
<td>2 semester hours per week for winter and summer term</td>
<td>4</td>
<td>SoSe und WiSe</td>
<td>56</td>
</tr>
<tr>
<td>Exercises</td>
<td>1 semester hour per week for winter and summer term.</td>
<td>2</td>
<td>SoSe und WiSe</td>
<td>28</td>
</tr>
<tr>
<td>Tutorial</td>
<td>2 semester hours per week in winter and summer term</td>
<td></td>
<td>SoSe und WiSe</td>
<td>0</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module** 84 h
### psy250 - Internship

<table>
<thead>
<tr>
<th>Module label</th>
<th>Internship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy250</td>
</tr>
<tr>
<td>Credit points</td>
<td>15.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>450 h</td>
</tr>
<tr>
<td>Applicability of the module</td>
<td>· Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Responsible persons</td>
<td>Kranczioch-Debener, Cornelia (Module responsibility)</td>
</tr>
<tr>
<td></td>
<td>Kranczioch-Debener, Cornelia (Authorized examiners)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td>Goals of module: Students will obtain direct experience in the field of psychology. This includes being involved in the provision of psychological or neuropsychological services in real-life situations, such as neuropsychological testing or counselling in a hospital or mental health clinic, or conducting and contributing to psychological research. The internship should be chosen by the student such that it can provide a meaningful educational opportunity that will help students to decide on their preferred area of work.</td>
</tr>
<tr>
<td></td>
<td>Competencies: ++ expert neuropsychological/neurophysiological knowledge + interdisciplinary knowledge &amp; thinking + experimental methods ++ ethics / good scientific practice / professional behavior ++ knowledge transfer + project &amp; time management</td>
</tr>
<tr>
<td>Module contents</td>
<td>The student 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.</td>
</tr>
<tr>
<td>Reader's advisory</td>
<td></td>
</tr>
<tr>
<td>Links</td>
<td>Information on internships and necessary forms: <a href="https://uol.de/en/psychology/master/course-overview/">https://uol.de/en/psychology/master/course-overview/</a></td>
</tr>
<tr>
<td>Languages of instruction</td>
<td>English , German</td>
</tr>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>irregular</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
<tr>
<td>Reference text</td>
<td>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 and the report form can be found on the programme website. To generate ideas, a folder with information on internships that other students have performed is available in the office of Dr. Cornelia Kranczioch. Please note that, due to the Coronavirus pandemic, you have to hand in a risk assessment form before starting your internship. You can find this form in English or German in the list of supporting documents!</td>
</tr>
<tr>
<td>Modullevel / module level</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart / typ of module</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lehr-/Lernform / Teaching/Learning method</td>
<td>internship at (external) institution</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>Time of examination</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>Individual; 2-3 possibilities per semester to present the internship to other students</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Course type</td>
<td>Practical training</td>
</tr>
<tr>
<td>SWS</td>
<td>SoSe und WiSe</td>
</tr>
</tbody>
</table>
| Workload attendance      | 0 h /
|                        | 450 h attendance at internship institution |
psy120 - Psychological assessment and diagnostics

Module label | Psychological assessment and diagnostics
Module code | psy120
Credit points | 9.0 KP
Workload | 270 h
Applicability of the module
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons
- Hildebrandt, Andrea (Module responsibility)
- Hellmann, Andreas (Module responsibility)
- Hildebrandt, Andrea (Authorized examiners)
- Hellmann, Andreas (Authorized examiners)
- Debener, Stefan (Module counselling)

Prerequisites
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module
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

Module contents
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 / practicing tests

Reader's advisory
Will be specified in the courses.

Links
Language of instruction | English
Duration (semesters) | 2 Semester
Module frequency | The module will be offered every winter term.
Module capacity | unlimited
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.

<table>
<thead>
<tr>
<th>Modullevel / module level</th>
<th>MM (Mastermodul / Master module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulart / typ of module</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lehr-/Lernform / Teaching/Learning method</td>
<td>Part 1: 1 lecture; Part 2: 1 seminar; Part 3: 1 seminar</td>
</tr>
</tbody>
</table>

Vorkenntnisse / Previous knowledge

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</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>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2</td>
<td>WiSe</td>
<td>28</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>4</td>
<td>SuSe</td>
<td>56</td>
</tr>
</tbody>
</table>

Total time of attendance for the module: 84 h
psy110 - Research methods

Module label: Research methods
Module code: psy110
Credit points: 12.0 KP
Workload: 360 h

Applicability of the module:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Responsible persons:
- Hildebrandt, Andrea (Module responsibility)
- Hildebrandt, Andrea (Authorized examiners)

Prerequisites:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:

Goals of module:
Students will acquire basic knowledge in planning empirical investigations, 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

Module contents

Part 1: Multivariate Statistics I (lecture): winter
- Graphical representation of multivariate data
- The Generalized Linear Modeling (GLM) framework
- Multiple and moderated linear regression with quantitative and qualitative predictors
- Logistic regression
- Multilevel regression (Generalized Linear Mixed Effects Modeling – GLMM)
- Non-linear regression models
- Path modeling
- Factor analysis (exploratory & confirmatory)
- (Multilevel) Structural equation modeling (SEM linear and non-linear)

Part 2: Analysis Methods with R (seminar): winter and summer
- Data examples and applications of GLM, GLMM, polynomial, spline and local regression, path modeling, factor analyses and SEM

Part 3: Multivariate Statistics II (lecture): summer
- Supervised and unsupervised statistical learning and prediction
- Regularized regression
- Resampling methods
- Tree-based methods
- Support Vector Machines
- Neural Networks (basics)
- Principal components and clustering

Part 4: Evaluation research (seminar): summer
- Paradigms and methods in applied evaluation research (quantitative, mixed-methods)
- Types of studies and designs in evaluation research (experimental, quasi-experimental, (multiple) time
- Specific statistical tools (e.g., Propensity score matching)
- Research synthesis and meta-analysis

### Reader's advisory

### Links

<table>
<thead>
<tr>
<th>Language of instruction</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration (semesters)</td>
<td>2 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>The module will start every winter term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
<tr>
<td>Modulelevel / module level</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart / typ of module</td>
<td>Pflicht / Mandatory</td>
</tr>
</tbody>
</table>

| Lehr-/Lernform / Teaching/Learning method | 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 |

### Examination

| Final exam of module                  | The module will be tested with an oral exam (20 min). |
| Time of examination                   | Required active participation for gaining credits: attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term). |

### Course type

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>4</td>
<td>SoSe und WiSe</td>
<td>56</td>
</tr>
<tr>
<td>Seminar</td>
<td>R seminar in summer is voluntary</td>
<td>4</td>
<td>SoSe und WiSe</td>
<td>56</td>
</tr>
<tr>
<td>Tutorial</td>
<td>statistics</td>
<td></td>
<td>SoSe und WiSe</td>
<td>0</td>
</tr>
</tbody>
</table>

| Total time of attendance for the module | 112 h |
**psy140 - Minor**

<table>
<thead>
<tr>
<th>Module label</th>
<th>Minor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy140</td>
</tr>
<tr>
<td>Credit points</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td>Applicability of the module</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Responsible persons</td>
<td>Bleichner, Kerstin (Module counselling)</td>
</tr>
<tr>
<td></td>
<td>Rieger, Jochem (Module counselling)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Skills to be acquired in this module</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>Module contents</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>
<tr>
<td></td>
<td>The content of the courses/modules taken as Minor needs to be clearly different from the contents of the Neurocognitive Psychology modules.</td>
</tr>
<tr>
<td></td>
<td>A list of approved courses/modules can be found on our website.</td>
</tr>
<tr>
<td></td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>Students whose first language is not German, may take German classes.</td>
</tr>
<tr>
<td></td>
<td>We recommend taking modules/courses that strengthen your own professional profile.</td>
</tr>
</tbody>
</table>

**Reader's advisory**

- 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 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.
- It is your responsibility to ask the teacher whether you can take part.

**Links**

List of approved courses/modules and approval form: [https://uol.de/en/psychology/master/course-overview/](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**

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 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.
- It is your responsibility to ask the teacher whether you can take part.

**Exam type**

- Course or seminar

**Course type**

Course or seminar
Please refer to the module description for information on the courses you can have counted towards psy140 Minor.

<table>
<thead>
<tr>
<th>SWS</th>
<th>Frequency</th>
<th>SoSe und WiSe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workload attendance</td>
<td>0 h</td>
<td>Depend on the chosen course, but at least 14 hours attendance.</td>
</tr>
</tbody>
</table>
Abschlussmodul

mam - Master´s Degree Module

<table>
<thead>
<tr>
<th>Module label</th>
<th>Master´s Degree Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>mam</td>
</tr>
<tr>
<td>Credit points</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>

Applicability of the module

- Master's Programme Neurocognitive Psychology (Master) > Abschlussmodul

Responsible persons

- Al-Zubaidi, Arkan (Authorized examiners)
- Bleichner, Martin Georg (Authorized examiners)
- Debener, Stefan (Authorized examiners)
- Gießing, Carsten (Authorized examiners)
- Hellmann, Andreas (Authorized examiners)
- Herrmann, Christoph Siegfried (Authorized examiners)
- Hildebrandt, Andrea (Authorized examiners)
- Hildebrandt, Helmut (Authorized examiners)
- Kasten, Florian (Authorized examiners)
- Kranczioch-Debener, Cornelia (Authorized examiners)
- Liu, Xinyang (Authorized examiners)
- Mirkovic, Bojana (Authorized examiners)
- Özyurt, Jale Nur (Authorized examiners)
- Rieger, Jochem (Authorized examiners)
- Stecher, Heiko (Authorized examiners)
- Strüber, Daniel (Authorized examiners)
- Thiel, Christiane Margarete (Authorized examiners)
- Unni, Anirudh (Authorized examiners)
- Puschmann, Sebastian (Authorized examiners)
- Meyer-Abich de Sousa Guerreiro, Maria (Authorized examiners)

Further responsible persons

- thesis supervisors;
- 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;
- Completion of at least 60 credit points in other modules including module psy240 (psy241) (Computation in Neuroscience);
- Assignment of a topic by thesis supervisor and official application with the examination office.

Skills to be acquired in this module

Goals of module:
Students will demonstrate that they are able to perform a 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
**Module contents**

**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.

**Reader's advisory**

**Links**
Rules and guidelines for Master's theses are explained here: 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. Please note that, due to the Coronavirus pandemic, you have to hand in a risk assessment form before starting your external Master's thesis. You can find this form in English or German in the list of supporting documents!

We encourage students to use the LaTeX template provided on the course website.

**Modullevel / module level**
Abschlussmodul (Abschlussmodul / Conclude)

**Modulart / typ of module**
Pflicht / Mandatory

**Lehr-/Lernform / Teaching/Learning method**
individual thesis preparation with supervision

**Vorkenntnisse / Previous knowledge**
contact your supervisor for details

**Examination**

<table>
<thead>
<tr>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>individual appointments</td>
<td>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%).</td>
</tr>
</tbody>
</table>

**Course type**
Seminar and project

**SWS**
2

**Frequency**
SoSe und WiSe

**Workload attendance**
28 h  
( Attendance as required for your project and 2 hours per week for participating in the lab meetings.)