## Modules for Neurocognitive Psychology

### Mastermodule

**psy110 - Research methods**

<table>
<thead>
<tr>
<th>Module label</th>
<th>Research methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy110</td>
</tr>
<tr>
<td>Credit points</td>
<td>12.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>360 h</td>
</tr>
</tbody>
</table>

**Used in course of study**
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

**Contact person**
- Module responsibility
  - Andrea Hildebrandt

**Entry requirements**
- 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 series, etc.)
- Specific statistical tools (e.g., Propensity score matching)
- Research synthesis and meta-analysis

Reader's advisory

Language of instruction  English
Duration (semesters)  2 Semester
Module frequency  The module will start every winter term.
Module capacity  unlimited
Modullevel  MM (Mastermodul / Master module)
Modulart  Pflicht / Mandatory
Lern-/Lehrform / Type of program  Parts 1 and 3: lectures; Parts 2 and 4: seminars; additional tutorials are offered.
Vorkenntnisse / Previous knowledge  basic statistics; otherwise please attend Introductory Course Statistics
Examination  Final exam of module

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>R seminar in summer is voluntary</td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Tutorial</td>
<td>statistics</td>
<td>0.00</td>
<td>SuSe and WiSe</td>
<td>0 h</td>
</tr>
<tr>
<td>Total time of attendance for the module</td>
<td></td>
<td>112 h</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**psy121 - Psychological diagnostics**

<table>
<thead>
<tr>
<th>Module label</th>
<th>Psychological diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy121</td>
</tr>
<tr>
<td>Credit points</td>
<td>12.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>360 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
</tbody>
</table>

**Contact person**

- Module responsibility
  - Andrea Hildebrandt
- Authorized examiners
  - Andrea Hildebrandt
  - Andreas Hellmann
- Module counseling
  - Stefan Debener

**Entry requirements**

- 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): 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: The Assessment Process applied (seminar): winter**

- 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

**Part 3: Test theory and test construction (lecture): summer**

- Classical test theory
- Generalizability theory
- Item response theory
- Latent-State and Trait theory
- Measurement invariance across groups and time
- Constructing faking-resistant questionnaires and tests
**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**

<table>
<thead>
<tr>
<th>Language of instruction</th>
<th>English</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Duration (semesters)</th>
<th>2 Semester</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Module frequency</th>
<th>The module will start every winter term.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Module capacity</th>
<th>unlimited</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Modullevel</th>
<th>MM (Mastermodul / Master module)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Modulart</th>
<th>Pflicht / Mandatory</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Lern-Lehrform / Type of program</th>
<th>Part 1 and 3: 2 lectures ; Part 2 and 4: seminars</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Vorkenntnisse / Previous knowledge</th>
<th>You should know basic statistical concepts as they are also covered in the introductory course statistics.</th>
</tr>
</thead>
</table>

**Examination**

<table>
<thead>
<tr>
<th>Final exam of module</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>summer term</td>
<td>The module will be tested by a practical exercise (test application and protocol) 90% and an oral presentation of the planned contents 10%.</td>
</tr>
</tbody>
</table>

**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 (use attendance sheet that will be handed out in the beginning of the term).

**Course type**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
</tbody>
</table>

| Seminar |         | 4.00| SuSe and WiSe | 56 h |

**Total time of attendance for the module**

112 h
**psy130 - Communication of scientific results**

<table>
<thead>
<tr>
<th>Module label</th>
<th>Communication of scientific results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy130</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>○ Christoph Siegfried Herrmann</td>
</tr>
<tr>
<td></td>
<td>Module counceling</td>
</tr>
<tr>
<td></td>
<td>○ Daniel Strüber</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td></td>
</tr>
<tr>
<td>Goals of module:</td>
<td>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.</td>
</tr>
<tr>
<td>Competencies:</td>
<td>++ data presentation &amp; discussion</td>
</tr>
<tr>
<td></td>
<td>++ scientific literature</td>
</tr>
<tr>
<td></td>
<td>++ scientific English / writing</td>
</tr>
<tr>
<td></td>
<td>++ scientific communication skills</td>
</tr>
<tr>
<td></td>
<td>+ group work</td>
</tr>
</tbody>
</table>

**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 chose whether they want to attend the colloquium in the first, second or both semesters.
- Modullevel: MM (Mastermodul / Master module)
- Modullevel: MM (Mastermodul / Master module)
- Modulart: Pflicht / Mandatory
- Modulart: Pflicht / Mandatory

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

**Vorkenntnisse / Previous knowledge**
- Examination: Time of examination
- Final exam of module: during winter term
- 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 discussion in at least 1 colloquium.
<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Colloquium</td>
<td></td>
<td>2.00</td>
<td>SuSe and WiSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

Total time of attendance for the module 56 h
### psy141 - Minor

<table>
<thead>
<tr>
<th>Module label</th>
<th>Minor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy141</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module counseling</td>
</tr>
<tr>
<td></td>
<td>• Jochem Rieger</td>
</tr>
<tr>
<td></td>
<td>• Kerstin Bleicher</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
</tbody>
</table>

#### 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, psy276, 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

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, 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 rededicate 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>
<thead>
<tr>
<th>Module level</th>
<th>MM (Mastermodul / Master module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modularart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Lectures and seminars (depends on the chosen modules)</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>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>
<td></td>
</tr>
</tbody>
</table>

**Course type**

<table>
<thead>
<tr>
<th>SWS</th>
<th>4.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>SuSe or WiSe</td>
</tr>
<tr>
<td>Workload attendance</td>
<td>56 h</td>
</tr>
</tbody>
</table>
psy150 - Clinical Psychology

Module label: Clinical Psychology
Module code: psy150
Credit points: 9.0 KP
Workload: 270 h
Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
Module responsibility
- Christiane Margarete Thiel

Entry requirements:
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, hallucinogens)
Depression
Anxiety Disorders
Alzheimer's Disease
Schizophrenia
psychopathological assessment

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 of ADHD

Reader's advisory

- Selected papers (part 2)

Links

Languages of instruction: English, German
Duration (semesters): 2 Semester
<table>
<thead>
<tr>
<th><strong>Module frequency</strong></th>
<th>Part 1 will be offered every winter term, part 2 every summer term.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module capacity</strong></td>
<td>unlimited</td>
</tr>
<tr>
<td><strong>Modullevel</strong></td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td><strong>Modullevel</strong></td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td><strong>Modulart</strong></td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td><strong>Modulart</strong></td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td><strong>Lern-Lehrform / Type of program</strong></td>
<td>Part 1: lecture and seminar; part 2: seminar</td>
</tr>
<tr>
<td><strong>Lern-Lehrform / Type of program</strong></td>
<td>Part 1: lecture and seminar; part 2: seminar</td>
</tr>
<tr>
<td><strong>Vorkenntnisse / Previous knowledge</strong></td>
<td></td>
</tr>
</tbody>
</table>

<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>mid-February</td>
<td>The module will be tested with a written exam (2 h) 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>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Course type</strong></th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module** 84 h
# psy170 - Neurophysiology

<table>
<thead>
<tr>
<th>Module label</th>
<th>Neurophysiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy170</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>» Stefan Debener</td>
</tr>
</tbody>
</table>

## Entry requirements
Entry 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

<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>
</tbody>
</table>
### Module capacity

18 (The lecture is not restricted.)

### Reference text

PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy276, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!

### Modullevel

MM (Mastermodul / Master module)

### Modulart

Wahlpflicht / Elective

### Lern-/Lehrform / Type of program

Part 1: lecture; Part 2 and 3: seminars

### Examination

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

### Course type

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2 semester hours per week in first half of the winter term.</td>
<td>1.00</td>
<td>WiSe</td>
<td>14 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>2 semester hours per week in second half of the winter term. 2 semester hours per week in summer term.</td>
<td>3.00</td>
<td>SuSe and WiSe</td>
<td>42 h</td>
</tr>
</tbody>
</table>

### 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

Used in course of study
Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person
Module responsibility
Christiane Margarete Thiel

Entry requirements
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): winter
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)
1 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
MM (Mastermodul / Master module)

Modullevel
MM (Mastermodul / Master module)
<table>
<thead>
<tr>
<th>Modulart / Type of program</th>
<th>Lern-/Lehrform / Type of program</th>
<th>Vorkenntnisse / Previous knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wahlpflicht / Elective</td>
<td>Part 1: lecture and seminar; Part 2: seminar</td>
<td>Part 1: lecture and seminar; Part 2: seminar</td>
</tr>
</tbody>
</table>

**Course type**

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>1.00</td>
<td>WiSe</td>
<td>14 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>3.00</td>
<td>WiSe</td>
<td>42 h</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module**

56 h

The module will be tested with a written 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).
psy190 - Sex and Cognition

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

Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
- Module responsibility
  - Daniel Strüber

Entry requirements:
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

- [psy190 - Sex and Cognition](#)
<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 winter term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>30</td>
</tr>
<tr>
<td>Module level</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Module level</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Module type</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Module type</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: seminar</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: seminar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vorkenntnisse / Previous knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination</td>
</tr>
<tr>
<td>Time of examination</td>
</tr>
<tr>
<td>Type of examination</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

**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
Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person:
Module responsibility
- Stefan Debener
Entry requirements:
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

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).

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

Lern-Lehrform / Type of program:
Part 1: lecture; Part 2: seminar; Part 3: seminar
### 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 winter term</td>
<td>The module will be tested with a written exam of 2 h duration.</td>
</tr>
<tr>
<td></td>
<td></td>
<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>
</tr>
</tbody>
</table>

### Course type

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>SuSe or WiSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

### Total time of attendance for the module

56 h
psy210 - Applied Cognitive Psychology

Module label: Applied Cognitive Psychology
Module code: psy210
Credit points: 6.0 KP
Workload: 180 h

Used in course of study: Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person: Module responsibility
- Jochem Rieger

Entry requirements: 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 into practice. Examples of successful transfers will be analyzed. The lecture provides the theoretical basis, in the seminar the material is consolidated by examples from the literature which will be presented, critically analyzed and discussed.

Part 1: (Neuro)Cognitive Psychology in the wild I (lecture): 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): 1 Semester
Module frequency: Part 1 will be offered every summer term, part 2 every winter term.
<table>
<thead>
<tr>
<th>Module capacity</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)</td>
</tr>
</tbody>
</table>

<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>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>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

Total time of attendance for the module

56 h
psy220 - Human Computer Interaction

<table>
<thead>
<tr>
<th>Module label</th>
<th>Human Computer Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy220</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Jochem Rieger</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology or other programs related to the field (e.g. neuroscience, computer science, physics etc.).</td>
</tr>
</tbody>
</table>

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:

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.


BCI


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, psy276, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!

Modullevel
MM (Mastermodul / Master module)

Modulart
Wahlpflicht / Elective

Lern-/Lehrform / Type of program
Part 1: lecture; Part 2: practical 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 attendance
Lecture 2.00 SuSe 28 h
Seminar 2.00 SuSe 28 h

Total time of attendance for the module
56 h
ps230 - Neuromodulation of Cognition

Module label                   Neuromodulation of Cognition
Module code                   psy230
Credit points                 6.0 KP
Workload                      180 h
Used in course of study
   - Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person
   Module responsibility
      - Jochem Rieger
Entry requirements
   Enrollment 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

  Excitability, Oxford University Press
  Verlag

Links
Language of instruction   English
Duration (semesters)       1 Semester
Module frequency           The module will be offered every winter term.
Module capacity            15
Modullevel                 MM (Mastermodul / Master module)
Modullevel                 MM (Mastermodul / Master module)
<table>
<thead>
<tr>
<th>Modulart</th>
<th>Wahlpflicht / Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: seminar</td>
</tr>
</tbody>
</table>

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

- Part 1: lecture; Part 2: seminar

**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 winter term</td>
<td>Presentation 80% written test on the topics of the lecture 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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>
</tr>
</tbody>
</table>

**Course type**

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module**

56 h
### psy240 - Computation in Neuroscience

<table>
<thead>
<tr>
<th><strong>Module label</strong></th>
<th>Computation in Neuroscience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module code</strong></td>
<td>psy240</td>
</tr>
<tr>
<td><strong>Credit points</strong></td>
<td>9.0 KP</td>
</tr>
<tr>
<td><strong>Workload</strong></td>
<td>270 h</td>
</tr>
<tr>
<td><strong>Used in course of study</strong></td>
<td>Master’s Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td><strong>Contact person</strong></td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>○ Heiko Stecher</td>
</tr>
<tr>
<td><strong>Entry requirements</strong></td>
<td>Enrolment in Master’s programme Neurocognitive Psychology.</td>
</tr>
</tbody>
</table>

#### 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**  
- Classes and objects  
- Parallel processing  
- Frequency analysis methods  
- EEG processing

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

#### Links

<table>
<thead>
<tr>
<th><strong>Language of instruction</strong></th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration (semesters)</strong></td>
<td>2 Semester</td>
</tr>
</tbody>
</table>
Module frequency
The module will start every winter term.

Module capacity
unlimited

Module level
MM (Mastermodul / Master module)

Module art
Pflicht / Mandatory

Lern-/Lehrform / Type of program
Part 1 and 2: lectures; Part 3 and 4: exercises; Part 5: seminar; additional tutorials

Vorkenntnisse / Previous knowledge
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.

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).

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Exercises</td>
<td></td>
<td>2.00</td>
<td>SuSe and WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Tutorial</td>
<td></td>
<td>0.00</td>
<td>SuSe or WiSe</td>
<td>0 h</td>
</tr>
</tbody>
</table>

Total time of attendance for the module
112 h
psy251 - Internship

Module label | Internship
Module code | psy251
Credit points | 12.0 KP
Workload | 360 h

Used in course of study
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person
Module responsibility
- Cornelia Kranczioch-Debener

Entry requirements
Enrolment in Master's programme Neurocognitive Psychology.

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/neuropsychological 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.

Reference text

Languages of instruction | English , German
Duration (semesters) | 1 Semester
Module frequency | irregular
Module capacity | unlimited

Links
Information on internships and necessary forms: https://uol.de/en/psychology/master/course-overview/

Module level
MM (Mastermodul / Master module)

Module type
Internship at (external) institution

Languages of instruction
English , German
Duration (semesters) | 1 Semester
Module frequency | irregular
Module capacity | unlimited

Reference text
The internship lasts 360 hours (9-10 weeks). It can be performed at 2 different institutions with a 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.
### Vorkenntnisse / Previous knowledge

<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</td>
<td>The students have to hand in a written report (2-3</td>
</tr>
<tr>
<td></td>
<td>the internship to other students</td>
<td>pages) and give a short presentation about their internship.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>They have to show a certificate from the institution at</td>
</tr>
<tr>
<td></td>
<td></td>
<td>which they performed the internship.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The internship is evaluated as pass/fail.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Practical</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SWS</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>SuSe or WiSe</td>
<td></td>
</tr>
<tr>
<td>Workload attendance</td>
<td>0 h (360 hours presence at internship institution)</td>
<td></td>
</tr>
</tbody>
</table>
psy260 - Practical project

Module label: Practical project  
Module code: psy260  
Credit points: 9.0 KP  
Workload: 270 h  
(attendance in the lab and accompanying seminars as necessary for your project (~ 200h))

Used in course of study:  
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person  
Module responsibility:  
- Jochem Rieger  
- Christoph Siegfried Herrmann  
- Stefan Debener  
- Jalenur Ozyurt  
- Andrea Hildebrandt

Module counseling:  
- Riklef Weerda

Entry requirements:  
Enrolment in Master's programme Neurocognitive Psychology.  
You can only start the practical project if you have passed the exam of psy241 / psy240 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 will learn to plan, perform and analyse a study in the field of neurocognition. They will need to apply statistical knowledge and programming competencies to the data acquisition and analysis of data. Results will be related to the current neurocognitive literature and presented in a student poster symposium at the end of the module. Additionally, students should gain experience as participants in studies.

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

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/
<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 winter term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
<tr>
<td>Reference text</td>
<td>Topics for projects will be presented in a colloquium at the end of the summer term. Students can choose 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).</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>practical work and regular seminar meetings in the group where the project is performed</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>practical work and regular seminar meetings in the group where the project is performed</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>PLEASE NOTE: Many projects require knowledge of either EEG, fMRI, TBS, or HCI analysis! We strongly recommend to take either psy170: Neurophysiology, psy270/276: fMRI Data Analysis, psy280: Transcranial Brain Stimulation, or psy220 Human Computer Interaction prior to the practical project. It is expected that students show basic knowledge of Matlab programming before starting the practical project.</td>
</tr>
<tr>
<td>Examination</td>
<td>Time of examination</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>usually end of April</td>
</tr>
<tr>
<td>Course type</td>
<td>Comment</td>
</tr>
<tr>
<td>Seminar</td>
<td>Please select the group in which you perform your practical project.</td>
</tr>
<tr>
<td>Practical</td>
<td>attendance as necessary for your project (~ 200h)</td>
</tr>
<tr>
<td>Total time of attendance for the module</td>
<td>28 h</td>
</tr>
</tbody>
</table>
### psy270 - Functional MRI Data Analysis

<table>
<thead>
<tr>
<th>Module label</th>
<th>Functional MRI Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy270</td>
</tr>
<tr>
<td>Credit points</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Carsten Gießing</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
</tbody>
</table>

### Skills to be acquired in this module

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

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

### Module contents

<table>
<thead>
<tr>
<th>Part 1: Functional MRI data analysis (lecture): summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 2: Planning, performance and analysis of functional neuroimaging studies using MATLAB-based software (seminar): summer</td>
</tr>
<tr>
<td>Part 3: Hands-on fMRI data analysis with SPM (exercise): summer</td>
</tr>
</tbody>
</table>

### 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>
</tbody>
</table>

### Reference text

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

**PLEASE NOTE:**

We strongly recommend to take either psy170, psy270, psy276, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!

You can take either psy270 or psy276 due to overlapping content.

**Modullevel**

MM (Mastermodul / Master module)

**Modulart**

Wahlpflicht / Elective
### Modulart / Wahlpflicht / Elective

<table>
<thead>
<tr>
<th>Lern-/Lehrform / Type of program</th>
<th>Part 1: lecture; Part 2: seminar; Part 3: exercise</th>
</tr>
</thead>
</table>

### Lern-/Lehrform / Type of program

<table>
<thead>
<tr>
<th>Vorkenntnisse / Previous knowledge</th>
<th>Students need to have solid statistical knowledge as taught in the Introductory Course Statistics and in Research Methods.</th>
</tr>
</thead>
</table>

### Examination

<table>
<thead>
<tr>
<th>Final exam of module</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</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).

### Course type

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Exercises</td>
<td></td>
<td>4.00</td>
<td>SuSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>1.00</td>
<td>SuSe</td>
<td>14 h</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module**: 98 h
psy276 - Essentials of fMRI Data Analysis with SPM and FSL

Module label: Essentials of fMRI Data Analysis with SPM and FSL
Module code: psy276
Credit points: 9.0 KP
Workload: 270 h
Used in course of study: Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person: Module responsibility
  - Riklef Weerda
  - Peter Sörös
Entry requirements: Enrolment in Master's programme Neurocognitive Psychology, 3rd semester or higher.
Skills to be acquired in this module:
Goals of this module:
This module offers a concise introduction to the basic principles of functional magnetic resonance imaging (fMRI). Students will gain essential knowledge about experimental design, data collection and analysis. Special emphasis will be laid on the statistical background of fMRI data analysis and a hands-on introduction to SPM and FSL, two widely-used and free software packages for fMRI data analysis and results visualisation.
Competencies:
+ Neuropsychological / neurophysiological knowledge
+ interdisciplinary knowledge & thinking
  ++ experimental methods
  ++ statistics & scientific programming
+ data presentation & discussion
+ independent research
+ scientific literature
+ ethics / good scientific practice / professional behaviour
+ critical & analytical thinking
+ group work

Module contents:
- Methodological basics of functional magnetic resonance imaging (fMRI)
- Basic principles of fMRI experimental design and data collection
- Statistical background of fMRI data analysis
- Hands-on training in fMRI data analysis and results visualisation with SPM and FSL

Reader's advisory:

Links:
Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: The module will be offered in the winter term, blocked in the first half (seven weeks).
Module capacity: unlimited
Reference text: PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy276, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses! You can take either psy270 or psy276 due to overlapping content.
Modullevel: MM (Mastermodul / Master module)
Modulart: Wahlpflicht / Elective
<table>
<thead>
<tr>
<th>Modulart</th>
<th>Wahlpflicht / Elective</th>
</tr>
</thead>
</table>
| Lern-/Lehrform / Type of program | Part 1: 1 seminar (2 SWS)  
Part 2: 1 supervised exercise (3 SWS) |
| Lern-/Lehrform / Type of program | Part 1: 1 seminar (2 SWS)  
Part 2: 1 supervised exercise (3 SWS) |
| Vorkenntnisse / Previous knowledge | |
| Examination | Time of examination | Type of examination |
| Final exam of module | end of winter term | written exam |
| Required active participation for gaining credits: |
| 1 presentation |
| 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 attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Exercises</td>
<td></td>
<td>3.00</td>
<td>WiSe</td>
<td>42 h</td>
</tr>
</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
Used in course of study  • Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person Module responsibility
  ▪ Christoph Siegfried Herrmann
Entry requirements 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 (artefact 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
Language of instruction English
Duration (semesters) 1 Semester
Module frequency
The module will be offered every summer term.

Module capacity
10

Reference text
We strongly recommend to take either psy170, psy270, psy276, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's thesis!

Modullevel
MM (Mastermodul / Master module)

Modulart
Wahlpflicht / Elective

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

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).

Course type     SWS  Frequency Workload attendance
---------------------------------------------
Lecture          2.00    SuSe      28 h
Seminar          2.00    SuSe      28 h

Total time of attendance for the module
56 h
**psy241 - Computation in Neuroscience**

<table>
<thead>
<tr>
<th>Module label</th>
<th>Computation in Neuroscience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy241</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in course of study</td>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>• Johannes Voßkuhl</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td><strong>Goals of module:</strong> 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.</td>
</tr>
<tr>
<td></td>
<td><strong>Competencies:</strong>  + Neuropsychological / neurophysiological knowledge</td>
</tr>
<tr>
<td></td>
<td>+ experimental methods</td>
</tr>
<tr>
<td></td>
<td>+ statistics &amp; scientific programming</td>
</tr>
<tr>
<td></td>
<td>+ critical &amp; analytical thinking</td>
</tr>
<tr>
<td></td>
<td>+ knowledge transfer</td>
</tr>
<tr>
<td></td>
<td>+ group work</td>
</tr>
<tr>
<td>Module contents</td>
<td><strong>Part 1: Introduction to scientific programming I (theoretical-practical seminar)</strong></td>
</tr>
<tr>
<td></td>
<td>• Basic data types and structures</td>
</tr>
<tr>
<td></td>
<td>• Flow control (conditions, loops, errors)</td>
</tr>
<tr>
<td></td>
<td>• Testing and debugging</td>
</tr>
<tr>
<td></td>
<td>• Functions</td>
</tr>
<tr>
<td></td>
<td><strong>Part 2: Introduction to scientific programming II (theoretical-practical seminar)</strong></td>
</tr>
<tr>
<td></td>
<td>• Classes and objects</td>
</tr>
<tr>
<td></td>
<td>• Parallel processing</td>
</tr>
<tr>
<td></td>
<td>• Frequency analysis methods</td>
</tr>
<tr>
<td></td>
<td>• EEG processing</td>
</tr>
<tr>
<td></td>
<td><strong>Part 3: Scientific programming I (excercise)</strong></td>
</tr>
<tr>
<td></td>
<td>• Implementation of examples from part 1</td>
</tr>
<tr>
<td></td>
<td><strong>Part 4: Scientific programming II (exercise)</strong></td>
</tr>
<tr>
<td></td>
<td>• Implementation of examples from part 2</td>
</tr>
<tr>
<td>Reader's advisory</td>
<td><strong>Mathworks (2009): MATLAB online documentation</strong></td>
</tr>
<tr>
<td>Links</td>
<td><strong>Language of instruction</strong> English</td>
</tr>
<tr>
<td>Duration (semesters)</td>
<td>2 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>The module will be offered every winter term.</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
<tr>
<td>Modulelevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: theoretical-practical seminar; Part 2: theoretical-practical seminar; Part 3: excercise; Part 4: excercise; additional tutorials</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>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>

Course type

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theorie-Praxis-Seminare</td>
<td>2 semester hours per week for winter and summer term</td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Exercises</td>
<td>1 semester hour per week for winter and summer term.</td>
<td>2.00</td>
<td>SuSe and WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Tutorial</td>
<td>2 semester hours per week in winter and summer term</td>
<td>0.00</td>
<td>SuSe and WiSe</td>
<td>0 h</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>Used in course of study</td>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>• Cornelia Kranczioch-Debener</td>
</tr>
<tr>
<td>Entry requirements</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 provide 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 &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>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.</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>internship at (external) institution</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>Time of examination Type 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>Course type</td>
<td>Practical</td>
</tr>
<tr>
<td>SWS</td>
<td>0.00</td>
</tr>
<tr>
<td>Frequency</td>
<td>SuSe and WiSe</td>
</tr>
<tr>
<td>Workload attendance</td>
<td>0 h / 450 h attendance at internship institution</td>
</tr>
</tbody>
</table>
psy120 - Psychological diagnostics

Module label  Psychological diagnostics
Module code  psy120
Credit points  9.0 KP
Workload  270 h

Used in course of study  
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person
Module responsibility  
- Andrea Hildebrandt  
- Andreas Hellmann
Authorized examiners  
- Andrea Hildebrandt  
- Andreas Hellmann
Module counseling  
- Stefan Debener

Entry requirements  
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 / practising tests

Reader's advisory  
Will be specified in the courses.

Links
Language of instruction  
English
Duration (semesters)  
2 Semester
<table>
<thead>
<tr>
<th><strong>Module frequency</strong></th>
<th>The module will be offered every winter term.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module capacity</strong></td>
<td>unlimited</td>
</tr>
<tr>
<td><strong>Reference text</strong></td>
<td>If you want to earn the bonus, you need to use the official bonus sheet to prove your attendance which will be handed to you in the beginning of the winter term.</td>
</tr>
<tr>
<td><strong>Modullevel</strong></td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td><strong>Modulart</strong></td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td><strong>Lern-/Lehrform / Type of program</strong></td>
<td>Part 1: 1 lecture ; Part 2: 1 seminar; Part 3: 1 seminar</td>
</tr>
<tr>
<td><strong>Vorkenntnisse / Previous knowledge</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Examination</strong></td>
<td>Time of examination</td>
</tr>
<tr>
<td><strong>Final exam of module</strong></td>
<td>summer term</td>
</tr>
<tr>
<td><strong>Course type</strong></td>
<td>Comment</td>
</tr>
<tr>
<td>Lecture</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
</tr>
<tr>
<td><strong>Total time of attendance for the module</strong></td>
<td>84 h</td>
</tr>
</tbody>
</table>
psy275 - Essentials of fMRI Data Analysis with SPM and FSL

Module label: Essentials of fMRI Data Analysis with SPM and FSL

Module code: psy275

Credit points: 6.0 KP

Workload: 180 h

Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
Module responsibility
- Riklef Weerda
- Peter Sörös

Entry requirements:
Enrolment in Master's programme Neurocognitive Psychology, 3rd semester or higher.

Skills to be acquired in this module:
- Neuropsychological / neurophysiological knowledge
- Interdisciplinary knowledge & thinking
- Experimental methods
- Statistics & scientific programming
- Data presentation & discussion
- Independent research
- Scientific literature
- Ethics / good scientific practice / professional behaviour
- Critical & analytical thinking
- Group work

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

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

Reader's advisory:

Links
Language of instruction: English

Duration (semesters): 1 Semester

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

Module capacity: 20

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

Modullevel: MM (Mastermodul / Master module)

Modulart: Wahlpflicht / Elective

Lern-Lehrform / Type of program:
- Part 1: 1 seminar (1 SWS)
- Part 2: 1 supervised exercise (3 SWS)

Vorkenntnisse / Previous knowledge:

Examination:
- Time of examination: end of winter term
- Type of examination: written exam

Course type: Seminar
- Comment: 1.00
- SWS: 1.00
- Frequency: WiSe
- Workload: 14 h
- Attendance: 56 h. (4 SWS), reading and practising: 124 h., total: 180 h.

Course type: Exercises
- Comment: 3.00
- SWS: 3.00
- Frequency: WiSe
- Workload: 42 h
- Attendance: 56 h. (4 SWS), reading and practising: 124 h.,
<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>total: 180 h.</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module** 56 h
Psy200 - Neuropsychology

Module label: Neuropsychology
Module code: psy200
Credit points: 9.0 KP
Workload: 270 h

Used in course of study:
- Master's Programme Neurocognitive Psychology (Master) > Mastermodule

Contact person:
- Module responsibility
  - Stefan Debener

Entry requirements:
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, 4), acquire specific knowledge on cognitive rehabilitation (part 2), and learn to understand, communicate and evaluate progress in clinical practice and experimental research in neuropsychology (part 3, 4).

Competencies:
- ++ neuropsychological / neurophysiological knowledge
- + 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)
- Cortical lobes (anatomy, functions, lesion symptoms, neuropsychological tests)
- Higher functions (learning & memory, language, emotion, spatial behavior attention)
- Plasticity and disorders (development, learning and reading disabilities, recovery)

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

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

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

Reader's advisory

Links
Languages of instruction: English, German
Duration (semesters): 2-3 Semester
Module frequency: The module will be offered every winter term.
Module capacity: 30 (Part 4 is not restricted.)
Reference text:
3 CP for each module part, choose 3 out of 4 parts! Part 1 (lecture) is mandatory.
If you want to earn the bonus, you need to use the official bonus sheet to prove your attendance which will be handed to you in the beginning of the winter term.

Modullevel: MM (Mastermodul / Master module)
<table>
<thead>
<tr>
<th>Modulart</th>
<th>Wahlpflicht / Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: seminar; Part 3: colloquium; Part 4: seminar</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>exam period at the end of winter term</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Colloquium</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</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>Used in course of study</td>
<td>• Master's Programme Neurocognitive Psychology (Master) &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Module counseling</td>
</tr>
<tr>
<td></td>
<td>• Kerstin Bleichner</td>
</tr>
<tr>
<td></td>
<td>• Jochem Rieger</td>
</tr>
<tr>
<td>Entry requirements</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>
<tr>
<td>Reader's advisory</td>
<td></td>
</tr>
<tr>
<td>Links</td>
<td>List of approved courses/modules and approval form: <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>PLEASE NOTE:</td>
</tr>
<tr>
<td></td>
<td>• 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)</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• It is your responsibility to ask the teacher whether you can take part.</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Pflicht / Mandatory</td>
</tr>
<tr>
<td>Lern- / Lehrform / Type of program</td>
<td>Lectures and seminars (depends on the chosen modules)</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td></td>
</tr>
<tr>
<td>Time of examination</td>
<td></td>
</tr>
<tr>
<td>Type of examination</td>
<td></td>
</tr>
<tr>
<td>Final exam of module</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>
</tr>
<tr>
<td>Course type</td>
<td>Course or seminar</td>
</tr>
</tbody>
</table>
(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>0.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>SuSe and WiSe</td>
</tr>
<tr>
<td>Workload attendance</td>
<td>0 h (Depends 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>
<tr>
<td>Used in course of study</td>
<td>• Master’s Programme Neurocognitive Psychology (Master) &gt; Abschlussmodul</td>
</tr>
<tr>
<td>Contact person</td>
<td></td>
</tr>
</tbody>
</table>

Entry requirements

- Enrolment in Master’s programme Neurocognitive Psychology.
- Completion of at least 60 credit points in other modules including module psy241 or psy240 (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
- +++ independent research
- + scientific literature
- +++ scientific English / writing
- + ethics / good scientific practice / professional behavior
- + critical & analytical thinking
- + scientific communication skills
- + knowledge transfer
- + + project & time management

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

Modullevel

- Abschlussmodul (Abschlussmodul / Conclude)

Modullevel

- MM (Mastermodul / Master module)

Modulart

- Pflicht / Mandatory

Modulart

- Pflicht / Mandatory
<table>
<thead>
<tr>
<th>Lern-/Lehrform / Type of program</th>
<th>individual thesis preparation with supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>individual thesis preparation with supervision</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>contact your supervisor for details</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>contact your supervisor for details</td>
</tr>
</tbody>
</table>

<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>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>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Seminar und Projekt</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWS</td>
<td>2.00</td>
</tr>
<tr>
<td>Frequency</td>
<td>SuSe and WiSe</td>
</tr>
<tr>
<td>Workload attendance</td>
<td>28 h (Attendance as required for your project and 2 hours per week for participating in the lab meetings.)</td>
</tr>
</tbody>
</table>