Modules for Neurocognitive Psychology

Mastermodule

psy110 - Research methods

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

Used in degree programmes
- Master Neurocognitive Psychology > Mastermodule

Contact person
- module responsibility
  - Martin Hecht

Prerequisites
- Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module

Goals of module:
Students will acquire basic knowledge about the planning of an empirical investigation, setting up computer-controlled experiments, multivariate statistical data analysis, and the interpretation, evaluation and synthesis of empirical results.

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)
- Basic concepts of probability, statistical inference, graphical representation of data
- Linear regression (simple and multiple) and analysis of variance
- Logistic regression, multivariate t-test

Part 2: Evaluation research (seminar)
- Methods and paradigms of evaluation
- Multidimensional Scaling and cluster analysis
- Decision making, meta-analysis

Part 3: Computer-controlled experimentation (seminar)
- Computer hardware basics
- Scripting and programming in Presentation
- Combining stimulus delivery with EEG
- Temporal precision

Part 4: Multivariate Statistics II (lecture)
- Principal component analysis and factor analysis
- Classification and discrimination
- Survival analysis
- Advanced methods (e.g., Bayesian estimation, ICA, machine learning)

Recommended reading

Links

Language of instruction
- English

Duration (semesters)
- 2 semester

Module frequency

Module capacity
- unlimited
### Module Level

MM (Mastermodul / Master module)

### Module Art

Pflicht / Mandatory

### Type of Program

Parts 1 and 4: lectures; Parts 2 and 3: seminars; additional tutorials are offered.

### Previous Knowledge

Basic statistics; otherwise please attend Introductory Course Statistics

### Examination

<table>
<thead>
<tr>
<th>Course type</th>
<th>Examination periods</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2 semester hours per week in winter term, 4 semester hours per week in summer term</td>
<td>Final exam of module</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>The module will be tested with an oral exam (20 min). Bonus for creating a script for the presentation on experimental stimuli in part 3.</td>
</tr>
<tr>
<td>Seminar</td>
<td>Part 2: 2 semester hours per week Part 3: 4 semester hours per week in the first half of the winter term.</td>
<td>4</td>
</tr>
<tr>
<td>Tutorial</td>
<td>Winter term: 2 hours/week (statistics) Summer term: 2 x 2 hours/week (statistics and R)</td>
<td>SumSem and WinSem</td>
</tr>
</tbody>
</table>

### Workload Attendance

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer Rhythm</th>
<th>Workload Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2 semester hours per week in winter term, 4 semester hours per week in summer term</td>
<td>6</td>
<td>SunSem and WinSem</td>
<td>84 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>Part 2: 2 semester hours per week Part 3: 4 semester hours per week in the first half of the winter term.</td>
<td>4</td>
<td>WinSem</td>
<td>56 h</td>
</tr>
<tr>
<td>Tutorial</td>
<td>Winter term: 2 hours/week (statistics) Summer term: 2 x 2 hours/week (statistics and R)</td>
<td></td>
<td>SumSem and WinSem</td>
<td>0 h</td>
</tr>
</tbody>
</table>

### Total Attendance Time of Module

140 h
psy120 - Psychological diagnostics

Module name: Psychological diagnostics
Module code: psy120
ECTS credit points: 9.0 KP
Workload: 270 h

Used in degree programmes
- Master Neurocognitive Psychology > Mastermodule

Contact person
- module responsibility
  - Andreas Hellmann
- authorized examiners
  - Andreas Hellmann
- Module counseling
  - Stefan Debener

Prerequisites
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module
Goals of module:
Students will acquire specific knowledge about psychological assessment and shall be able to utilize the knowledge both within a research context and within an applied context. They will learn to analyse a psychological question in terms of psychological assessment, design and plan the assessment process, select appropriate means, techniques and instruments, apply methods and conduct measurements, analyse and combine gathered information, draw conclusions, write reports and deliver expert opinion, reflect on the assessment process, follow ethical and professional rules.

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)
- models and approaches
- methods, processes, guidelines
- theory of testing, approaches to test construction

Part 2: Psychological Testing (seminar)
- types of tests
- exercises in testing / practising tests

Part 3: Assessment in Clinical Neuropsychology (seminar)
- specific knowledge
- exercises in testing / practising tests

Recommended reading

Links
Language of instruction: English
Duration (semesters): 2 semester
Module frequency: Mandatory
Module capacity: unlimited
Modullevel: MM (Mastermodul / Master module)
<table>
<thead>
<tr>
<th>Lern-/Lehrform / Type of program</th>
<th>Part 1: 1 lecture; Part 2: 1 seminar; Part 3: 1 seminar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>examination periods</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>summer term</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2</td>
<td>WinSem</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>4</td>
<td>SumSem</td>
<td>56 h</td>
</tr>
</tbody>
</table>

| Total attendance time of module | 84 h |
### psy130 - Communication of scientific results

**Module name**  
Communication of scientific results

**Module code**  
psy130

**ECTS credit points**  
6.0 KP

**Workload**  
180 h

**Used in degree programmes**  
- Master Neurocognitive Psychology > Mastermodule

**Contact person**  
- Module responsibility  
  - Christoph Siegfried Herrmann
  - Daniel Strüber

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

**Skills to be acquired in this module**

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

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

**Module contents**

**Part 1: Communication of scientific results (seminar)**

- Literature search
- Presentation skills
- Writing skills

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

**Recommended reading**  

**Links**

**Language of instruction**  
English

**Duration (semesters)**  
1-2 semester

**Module frequency**  
unlimited

**Module capacity**  
unlimited

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

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

**Modulart**  
Pflicht / Mandatory

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

**Vorkenntnisse / Previous knowledge**

**Examination**

**examination periods**  
during winter term

**Type of examination**  
The module requires an oral presentation that will be evaluated. Bonus for active participation (contribution to discussion, e.g. questions or comments) during the colloquium and attendance of at least 8 colloquium sessions.

**Course type**

<table>
<thead>
<tr>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminar</td>
<td>2</td>
<td>WinSem</td>
<td>28 h</td>
</tr>
<tr>
<td>Colloquium</td>
<td>2</td>
<td>SumSem and WinSem</td>
<td>28 h</td>
</tr>
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</table>

**Total attendance time of module**  
56 h
psy140 - Minor

<table>
<thead>
<tr>
<th>Module name</th>
<th>Minor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy140</td>
</tr>
<tr>
<td>ECTS credit points</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td>Used in degree programmes</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Skills to be acquired in this module</th>
<th>Goals of module:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will gain an overview of non-psychological topics related to cognitive neuroscience. This is intended to enable students to see how psychological theories apply in other fields. Possible modules are listed below. Upon approval German speaking students can attend a career-relevant language course (maximum of 6 CP for this module). Students who's first language is not German, may take German classes.</td>
<td></td>
</tr>
</tbody>
</table>

| Competencies               | ++ interdisciplinary knowledge & thinking |

<table>
<thead>
<tr>
<th>Module contents</th>
<th>Modules from the following fields can be taken without prior approval:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Cellular and molecular biology</td>
</tr>
<tr>
<td></td>
<td>• Behavioural neurobiology</td>
</tr>
<tr>
<td></td>
<td>• Psychophysics and Audiology</td>
</tr>
<tr>
<td></td>
<td>• Artificial intelligence and knowledge representation</td>
</tr>
<tr>
<td></td>
<td>• Man machine interaction (not in combination with module psy220 Human Computer Interaction)</td>
</tr>
<tr>
<td></td>
<td>• Computational neuroscience</td>
</tr>
<tr>
<td></td>
<td>• Evolutionary biology</td>
</tr>
<tr>
<td></td>
<td>• Rehabilitation pedagogics (taught in German)</td>
</tr>
<tr>
<td></td>
<td>• Linear models</td>
</tr>
<tr>
<td></td>
<td>• General linear models and semiparametric models</td>
</tr>
<tr>
<td></td>
<td>• Philosophy (taught in German)</td>
</tr>
<tr>
<td></td>
<td>• German as a foreign language (for non-German students)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommended reading</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Links</td>
<td>English, German</td>
</tr>
<tr>
<td>Duration (semesters)</td>
<td>1 semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td></td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
<tr>
<td>Information</td>
<td>PLEASE NOTE:</td>
</tr>
<tr>
<td></td>
<td>• If a course is not listed here, please request approval BEFORE you start the course</td>
</tr>
<tr>
<td></td>
<td>• Courses must be at Master's level (except language courses)</td>
</tr>
<tr>
<td></td>
<td>• Course descriptions need to state clear pass/fail criteria</td>
</tr>
<tr>
<td></td>
<td>• Language courses other than 'German as a foreign language' need to be career-relevant (i.e. necessary for internship, practical project or Master's thesis) and require approval</td>
</tr>
<tr>
<td></td>
<td>• Content of the Minor courses need to be clearly different from other taken courses of the study program</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module level</th>
<th>MM (Mastermodul / Master module)</th>
</tr>
</thead>
<tbody>
<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>examination periods</td>
</tr>
<tr>
<td>Type of examination</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>
</tbody>
</table>
# psy150 - Clinical Psychology

<table>
<thead>
<tr>
<th>Module name</th>
<th>Clinical Psychology</th>
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<tbody>
<tr>
<td>Module code</td>
<td>psy150</td>
</tr>
<tr>
<td>ECTS credit points</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td>Used in degree programmes</td>
<td>* Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
</tbody>
</table>

### Contact person
- module responsibility
  - Christiane Margarete Thiel

### Prerequisites
- Enrolment in Master's programme Neurocognitive Psychology.

### Skills to be acquired in this module
**Goals of the Module:**
Students acquire scientifically sound, critical thinking regarding the genesis and 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 and psychotherapeutic interventions. 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)
- Basics of neurotransmitter systems and psychopharmacology
- Substance Abuse (e.g. psychostimulants, hallucinogenics)
- Depression
- Anxiety Disorders
- Alzheimer’s Disease
- Schizophrenia

#### Part 1: Psychotherapeutic intervention of selected psychiatric disorders (seminar)

#### Part 2: Psychological interventions within the framework of evidence-based medicine (seminar)
- (partly in German): Concepts of evidence based treatment and treatment of acquired dysfunctions of the brain
- Treatment of ADHD

### Recommended reading
- Selected papers (part 2)

### Links
- Languages of instruction: English, German
- Duration (semesters): 2 semester
- Module frequency: unlimited
- Module level: MM (Mastermodul / Master module)
- Modulart: Wahlpflicht / Elective
- Lern-/Lehrform / Type of program: Part 1: lecture and seminar; part 2: seminar
- Vorkenntnisse / Previous knowledge: 8 / 35
<table>
<thead>
<tr>
<th>Examination</th>
<th>examination periods</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>in the term holiday (usually March)</td>
<td>The module will be tested with a written exam (2 h) on the contents of part 1. Bonus for a presentation and participation in discussions or group work in other parts of the module (the bonus must be achieved in all other classes/events).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2</td>
<td></td>
<td>WinSem</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>4</td>
<td></td>
<td>SunSem and WinSem</td>
<td>56 h</td>
</tr>
</tbody>
</table>

**Total attendance time of module** 84 h
psy170 - Neurophysiology

Module name  Neurophysiology
Module code  psy170
ECTS credit points  6.0 KP
Workload  180 h
Used in degree programmes  Master Neurocognitive Psychology > Mastermodule

Contact person  module responsibility
  □ Stefan Debener

Prerequisites  Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module  
Goals of module:

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

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

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

Part 1: Neurophysiology and neuroanatomy (lecture)

- Neurophysiology, EEG, EMG, ECG
- Neuroanatomy
- Time-domain and frequency-domain analysis methods

Part 2: EEG recording and analysis (theoretical-practical seminar)

- Recording and analysis of biomedical signals
- Averaging, filtering, signal-to-noise
- Topographical EEG analysis

Part 3: EEG analysis with Matlab (theoretical-practical seminar)

- EEGLAB file I/O, data structure and scripting
- Preprocessing, artefact rejection and artefact correction
- Statistical decomposition
- Event-related potentials, topographical mapping and power spectra
- Illustration of results

Recommended reading  

Links  
Language of instruction  English
Duration (semesters)  2 semester

Module capacity  24 (The lecture is not restricted.)

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

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

<table>
<thead>
<tr>
<th>Vorkenntnisse / Previous knowledge</th>
<th>examination periods</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 module will be tested with a written exam of 2 h duration. Bonus for recording electroencephalographic data.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</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</td>
<td>WinSem</td>
<td>14 h</td>
</tr>
<tr>
<td>theory and practice 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</td>
<td>SumSem and WinSem</td>
<td>42 h</td>
</tr>
<tr>
<td>Tutorial</td>
<td>2 hours/week</td>
<td></td>
<td>SumSem</td>
<td>0 h</td>
</tr>
</tbody>
</table>

Total attendance time of module 56 h
psy181 - Neurocognition

Module name: Neurocognition
Module code: psy181
ECTS credit points: 6.0 KP
Workload: 180 h

Used in degree programmes:
- Master Neurocognitive Psychology > Mastermodule

Contact person:
- module responsibility
  - Christiane Margarete Thiel

Prerequisites:
Enrolment in Master's programme Neurocognitive Psychology.

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

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

Module contents:
Students will first acquire a general understanding of the brain mechanisms of different cognitive functions and the methods used to study these functions. They will then apply this knowledge by discussing current research topics (part 1). General knowledge will be focused on the relation between the development of the human brain and the cognitive processes it supports (part 2).

Part 1: Introduction to cognitive neuroscience (lecture and seminar)

- Brain and cognition, methods of cognitive neuroscience
- Attention, learning and memory
- Emotional and social behaviour
- Language, executive functions

Part 2: Neurocognitive development (seminar)

- Brain development and cortical plasticity
- Effects of early-life stress on brain development
- Development of object recognition, social cognition, memory, and executive functions

Recommended reading:

Links:

Language of instruction: English
Duration (semesters): 1 semester

Module capacity: 20 (Part 1 (lecture and seminar) are unrestricted, part 2 is restricted to 20 students.)

Module level: MM (Mastermodul / Master module)
Modulart: Wahlpflicht / Elective
Lern-/Lehrform / Type of program: Part 1: lecture and seminar; Part 2: seminar

Vorkenntnisse / Previous knowledge:

Examination periods:
The module will be tested with a written exam of 2 h duration on the contents of part 1. Bonus for a
<table>
<thead>
<tr>
<th>Examination</th>
<th>examination periods</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>presentation and participation in discussions on other presentations in the seminar.</td>
</tr>
<tr>
<td><strong>Course type</strong></td>
<td><strong>Comment</strong></td>
<td><strong>SWS</strong></td>
</tr>
<tr>
<td>Lecture</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Total attendance time of module</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**psy190 - Sex and Cognition**

<table>
<thead>
<tr>
<th>Module name</th>
<th>Sex and Cognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy190</td>
</tr>
<tr>
<td>ECTS credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in degree programmes</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>Daniel Strüber</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Enrolment in Master’s programme Neurocognitive Psychology. Neuroscience students can take part on request.</td>
</tr>
</tbody>
</table>

**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)**

- The measurement of sex differences
- Sex differences in emotion
- Sex differences in aggression
- Sex differences in cognitive abilities
- Hormones, sexual differentiation, and gender identity
- Sex hormones and play preferences
- Sex differences in hemispheric organization
- Brain size and intelligence

**Part 2: Sex, brain, and behaviour (seminar)**

- Sex differences in empathy
- The extreme male brain theory of autism (S. Baron-Cohen)
- Sex differences in neuropsychiatric disorders
- Sex differences in stress response
- Social implications of sex differences

**Recommended reading**


**Links**

**Language of instruction**

English

**Duration (semesters)**

1 semester

**Module frequency**

MM (Mastermodul / Master module)

**Modullevel**

Wahlpflicht / Elective

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

Part 1: lecture; Part 2: seminar

**Vorkenntnisse / Previous knowledge**
<table>
<thead>
<tr>
<th>Examination</th>
<th>examination periods</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>during summer term</td>
<td>The module requires an oral presentation that will be evaluated.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2</td>
<td>SumSem</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2</td>
<td>SumSem</td>
<td>28 h</td>
</tr>
</tbody>
</table>

Total attendance time of module 56 h
psy200 - Neuropsychology

Module name  Neuropsychology
Module code  psy200
ECTS credit points  9.0 KP
Workload  270 h
Used in degree programmes  • Master Neurocognitive Psychology > Mastermodule
Contact person  module responsibility
  ○ Stefan Debener
Prerequisites  Enrolment in Master’s programme Neurocognitive Psychology.

Skills to be acquired in this module

Goals of module: Students will learn to understand changes in thinking and behaviour that may arise from brain dysfunctions (part 1, 4), acquire specific knowledge on multisensory processes (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: Topics in Experimental Neuropsychology (seminar)
  • Neural properties of sensory processing in a multiple sensory systems framework
  • Human brain studies of multisensory processes
  • Cross-modal plasticity

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 (taught partly in German)
  • Clinical neuroanatomy
  • Neurodegenerative diseases
  • Dementia

Recommended reading

Links
Languages of instruction  English, German
Duration (semesters)  2-3 semester
Module frequency
Module capacity  30 (Part 4 is not restricted.)
Information  3 CP for each module part, choose 3 out of 4 parts! Part 1 (lecture) is mandatory.
Modullevel  MM (Mastermodul / Master module)
Modulart  Wahlpflicht / Elective
Lern-/Lehrform / Type of program  Part 1: lecture; Part 2: seminar; Part 3: colloquium; Part 4: seminar
Vorkenntnisse / Previous knowledge
<table>
<thead>
<tr>
<th>Examination</th>
<th>examination periods</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. Bonus for a presentation and participation in discussions on other presentations and attendance of at least 70% in part 2 and 3.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2</td>
<td></td>
<td>WinSem</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>4</td>
<td></td>
<td>SumSem and WinSem</td>
<td>56 h</td>
</tr>
<tr>
<td>Colloquium</td>
<td>2</td>
<td></td>
<td>SumSem</td>
<td>28 h</td>
</tr>
</tbody>
</table>

**Total attendance time of module**  
112 h
psy210 - Applied Cognitive Psychology

Module name: Applied Cognitive Psychology
Module code: psy210
ECTS credit points: 6.0 KP
Workload: 180 h

Used in degree programmes:
- Master Neurocognitive Psychology > Mastermodule

Contact person:
module responsibility
- Jochem Rieger

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

Skills to be acquired in this module:
Goals of the module:
The module aims to provide an overview of theories of (Neuro)Cognitive Psychology with potential for application. It will cover core concepts of cognitive psychology, their neuronal basis, basic knowledge of neuroimaging and data analysis techniques. Special emphasis will be put on research aiming at complex real-world settings and translation of basic science in to practice. Examples of successful transfers will be analyzed. Parts 1 (lecture) and 2 (seminar) will run in parallel. The lecture provides the theoretical basis. In the seminar the material is consolidated by examples from the literature will be presented and critically analyzed and discussed.

Competencies:
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.

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

Part 2: (Neuro)Cognitive Psychology in the wild II (seminar)
- 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.

Recommended reading:

Links:
Language of instruction: English
Duration (semesters): 1 semester
Module frequency:
Module capacity: 30
Information:
The module will be offered in summer terms and should be completed within one semester. Both parts will run in parallel.
Module level:
MM (Mastermodul / Master module)
**Modular**

Wahlpflicht / Elective

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

Part 1: 1 lecture (2 SWS),
Part 2: 1 seminar (2 SWS).

**Vorkenntnisse / Previous knowledge**

**Examination**

<table>
<thead>
<tr>
<th>Examination</th>
<th>examination periods</th>
<th>Type of examination</th>
</tr>
</thead>
</table>
| Final exam of module |                     | - The module will be evaluated with a written exam of 2 h duration.  
- bonus for a presentation and participation in discussions on other presentations in the seminar |

**Course type**

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2</td>
<td>SumSem</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2</td>
<td>SumSem</td>
<td>28 h</td>
</tr>
</tbody>
</table>

**Total attendance time of module**

56 h
### psy220 - Human Computer Interaction

<table>
<thead>
<tr>
<th>Module name</th>
<th>Human Computer Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy220</td>
</tr>
<tr>
<td>ECTS credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in degree programmes</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
</tbody>
</table>

**Contact person**
- module responsibility
  - Jochem Rieger

**Prerequisites**

**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 devices for human computer interaction. As a specific goal the module works toward the implementation of a brain computer interface (BCI). BCIs are ideal showcases as they fully span the interdisciplinary field of HCI design, implementation and evaluation.

**Competencies:**
++ Neuropsychological / neurophysiological knowledge
++ interdisciplinary knowledge & thinking
+ experimental methods
++ statistics & scientific programming
+ critical & analytical thinking
+ scientific communication skills
+ knowledge transfer
+ group work
+ project & time management

**Module contents**

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

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

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

**Part 2: HCI and BCI in practice (practical course)**
The second part of the module builds upon the theoretical concepts elaborated in the first. We will work through recent applications published in the literature and, where applicable, implement parts of a BCI-system and conduct experiments.

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

**Links**

**Language of instruction**
English

**Duration (semesters)**
2 semester

**Module frequency**

**Module capacity**
15

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

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

**Modulart**
Wahlpflicht / Elective

**Lern-/Lehrform / Type of program**
Part 1: lecture; Part 2: practical course

**Vorkenntnisse / Previous knowledge**

**Examination**

**examination periods**

**Type of examination**

The module will be evaluated with an oral exam (20 min). Bonus for a presentation and participation in discussions on other presentations in the seminar.

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2</td>
<td></td>
<td>SumSem</td>
<td>28 h</td>
</tr>
<tr>
<td>theory and practice seminar</td>
<td>2</td>
<td></td>
<td>WinSem</td>
<td>28 h</td>
</tr>
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</table>

**Total attendance time of module**: 56 h
**psy230 - Neuromodulation of Cognition**

<table>
<thead>
<tr>
<th>Module name</th>
<th>Neuromodulation of Cognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>psy230</td>
</tr>
<tr>
<td>ECTS credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in degree programmes</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Contact person</td>
<td>module responsibility</td>
</tr>
<tr>
<td></td>
<td>Jochem Rieger</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.</td>
</tr>
</tbody>
</table>

**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)**

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

**Part 2: Neurofeedback (seminar)**

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

**Recommended reading**


**Links**

Language of instruction: English

Duration (semesters): 1 semester

Module capacity: 15

Module level: MM (Mastermodul / Master module)

Modulart: Wahlpflicht / Elective

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

Vorkenntnisse / Previous knowledge:

Examination

examination periods

Type of examination
The module will be evaluated with an oral presentation in the seminar. Bonus for oral contribution.

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2</td>
<td></td>
<td>WinSem</td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>2</td>
<td></td>
<td>WinSem</td>
<td>28 h</td>
</tr>
<tr>
<td><strong>Total attendance time of module</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>56 h</strong></td>
</tr>
</tbody>
</table>
psy241 - Computation in Neuroscience

Module name: Computation in Neuroscience
Module code: psy241
ECTS credit points: 6.0 KP
Workload: 180 h

Used in degree programmes:
- Master Neurocognitive Psychology > Mastermodule

Contact person:
module responsibility
- Johannes Voßkuhl

Prerequisites:
Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module:
Goals of module:
Students will acquire scientific programming skills as well as specific knowledge of computational methods in neuroscience and cognition. They will learn to judge the appropriateness and complexity of computational problems and solutions.

Competencies:
- Neuropsychological / neurophysiological knowledge
- experimental methods
- statistics & scientific programming
- critical & analytical thinking
- knowledge transfer
- group work

Module contents:
Part 1: Introduction to scientific programming I (theoretical-practical seminar)
- Basic data types and structures
- Flow control (conditions, loops, errors)
- Testing and debugging
- Functions

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

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

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

Recommended reading:
- Mathworks (2009): MATLAB online documentation

Links:
Language of instruction: English
Duration (semesters): 2 semester
Module frequency: unlimited
Module level: MM (Mastermodul / Master module)
Modulart: Pflicht / Mandatory
Lern-/Lehrform / Type of program: Part 1: theoretical-practical seminar; Part 2: theoretical-practical seminar; Part 3: exercise; Part 4: exercise; additional tutorials
<table>
<thead>
<tr>
<th>Examination</th>
<th>examination periods</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>exam period at the end of the summer term</td>
<td>The participants will have to independently develop and program a solution for a given neuroscientific problem. Both the written code as well as the documentation of the approach taken will be assessed. Bonus for regularly handing in a total of 12 programming exercises.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>theory and practice seminar</td>
<td>2 semester hours per week for winter and summer term</td>
<td>4</td>
<td>SunSem and WinSem</td>
<td>56 h</td>
</tr>
<tr>
<td>Exercises</td>
<td>1 semester hour per week for winter and summer term.</td>
<td>2</td>
<td>SunSem and WinSem</td>
<td>28 h</td>
</tr>
<tr>
<td>Tutorial</td>
<td>2 semester hours per week in winter and summer term</td>
<td></td>
<td>SunSem and WinSem</td>
<td>0 h</td>
</tr>
<tr>
<td><strong>Total attendance time of module</strong></td>
<td></td>
<td></td>
<td></td>
<td>84 h</td>
</tr>
</tbody>
</table>
**psy250 - Internship**

<table>
<thead>
<tr>
<th><strong>Module name</strong></th>
<th>Internship</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module code</strong></td>
<td>psy250</td>
</tr>
<tr>
<td><strong>ECTS credit points</strong></td>
<td>15.0 KP</td>
</tr>
<tr>
<td><strong>Workload</strong></td>
<td>450 h</td>
</tr>
<tr>
<td><strong>Used in degree programmes</strong></td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td><strong>Contact person</strong></td>
<td>module responsibility</td>
</tr>
<tr>
<td></td>
<td>• Cornelia Kranczioch-Debener</td>
</tr>
<tr>
<td></td>
<td>• Hans Colonius</td>
</tr>
<tr>
<td><strong>Prerequisites</strong></td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
<tr>
<td><strong>Skills to be acquired in this module</strong></td>
<td>Goals of module: The goal of the internship is to provide students with the opportunity to participate in the daily work of professional psychologists in their job. Students will be able to make informed, career-specific decisions.</td>
</tr>
<tr>
<td></td>
<td>Competencies:</td>
</tr>
<tr>
<td></td>
<td>• experimental methods</td>
</tr>
<tr>
<td></td>
<td>• ethics / good scientific practice / professional behavior</td>
</tr>
<tr>
<td></td>
<td>• knowledge transfer</td>
</tr>
<tr>
<td></td>
<td>• project &amp; time management</td>
</tr>
<tr>
<td><strong>Module contents</strong></td>
<td>The students will work in a field of psychology and get to know the daily work routines of a psychologist.</td>
</tr>
<tr>
<td><strong>Recommended reading</strong></td>
<td>Links</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.uni-oldenburg.de/en/psychology/study-programme/master/internships/">http://www.uni-oldenburg.de/en/psychology/study-programme/master/internships/</a></td>
</tr>
<tr>
<td></td>
<td><a href="http://www.uni-oldenburg.de/en/psychology/study-programme/master/documents/">http://www.uni-oldenburg.de/en/psychology/study-programme/master/documents/</a></td>
</tr>
<tr>
<td><strong>Languages of instruction</strong></td>
<td>English, German</td>
</tr>
<tr>
<td><strong>Duration (semesters)</strong></td>
<td>1 semester</td>
</tr>
<tr>
<td><strong>Module frequency</strong></td>
<td>unlimited</td>
</tr>
<tr>
<td><strong>Module capacity</strong></td>
<td>unlimited</td>
</tr>
<tr>
<td><strong>Information</strong></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.</td>
</tr>
<tr>
<td></td>
<td>Please note that details are regulated in the exam regulations. A blank internship certificate can be found on the programme website.</td>
</tr>
<tr>
<td><strong>Modullevel</strong></td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td><strong>Lern-Lehrform / Type of program</strong></td>
<td>internship at (external) institution</td>
</tr>
<tr>
<td><strong>Vorkenntnisse / Previous knowledge</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Examination</strong></td>
<td>examination periods</td>
</tr>
<tr>
<td><strong>Final exam of module</strong></td>
<td>individual</td>
</tr>
<tr>
<td></td>
<td>Type of examination</td>
</tr>
<tr>
<td></td>
<td>The students have to hand in a written report (5-8 pages) about their internship and show a certificate from the institution at which they performed the internship. The internship is evaluated as pass/fail.</td>
</tr>
</tbody>
</table>
psy260 - Practical project

Module name: Practical project
Module code: psy260
ECTS credit points: 9.0 KP
Workload: 270 h

Used in degree programmes:
- Master Neurocognitive Psychology > Mastermodule

Contact person:
- module responsibility
  - Hans Colonius
  - Jochem Rieger
  - Christoph Siegfried Herrmann
  - Stefan Debener
  - Jalenur Özyurt
- Module counseling
  - Riklef Weerda

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

Recommended reading:

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

Language of instruction: English

Duration (semesters): 1 semester

Module frequency: unlimited

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

Students can chose to perform the practical work in either of the research groups of the Department of Psychology. External projects are possible upon approval (information and approval form can be found on the programme website).

Modullevel: MM (Mastermodul / Master module)
Modulart: Pflicht / Mandatory
Lern-/Lehrform / Type of program: practical work and regular seminar meetings in the group where the project is performed

Vorkenntnisse / Previous knowledge:
PLEASE NOTE: Many projects require knowledge of either EEG, fMRI, TBS, or HCI analysis! We strongly recommend to take either psy170: Neurophysiology, psy270: Functional Neuroimaging, psy280: Transcranial Brain Stimulation, or psy220 Human Computer Interaction prior to the practical project.
<table>
<thead>
<tr>
<th>Examination</th>
<th>examination periods</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>usually end of April</td>
<td>Poster presentation in a student symposium (30% of the grade) and daily project work (70% of the grade).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminar</td>
<td>Please select the group in which you perform your practical project.</td>
<td>2</td>
<td>WinSem</td>
<td>28 h</td>
</tr>
<tr>
<td>Practical</td>
<td></td>
<td>2</td>
<td>WinSem</td>
<td>28 h</td>
</tr>
</tbody>
</table>

| Total attendance time of module | 56 h |
### psy270 - Functional MRI Data Analysis

**Module name**
Functional MRI Data Analysis

**Module code**
psy270

**ECTS credit points**
9.0 KP

**Workload**
270 h

**Used in degree programmes**
- Master Neurocognitive Psychology > Mastermodule

**Contact person**
module responsibility
- Carsten Gießing

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

**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**

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

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

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

**Recommended reading**

**Links**

**Language of instruction**
English

**Duration (semesters)**
1 semester

**Module frequency**

**Module capacity**
20

The remaining places are reserved for Biology and Neuroscience students.

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

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

**Modulart**
Wahlpflicht / Elective

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

**Vorkenntnisse / Previous knowledge**

**Examination**

**examination periods**
end of summer term

**Type of examination**
Oral or written examination Bonus for active participation (e.g. presentations, creating study material for other participants, tandem learning or oral contributions)

**Course type**
Lecture

**Comment**

**SWS**
2

**Offer rhythm**
SumSem

**Workload attendance**
28 h
<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
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<tbody>
<tr>
<td>Seminar</td>
<td></td>
<td>1</td>
<td>SumSem</td>
<td>14 h</td>
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<td>Practical</td>
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<td>4</td>
<td>SumSem</td>
<td>56 h</td>
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**Total attendance time of module** 98 h
psy275 - Essentials of fMRI Data Analysis with SPM and FSL

Module name Essentials of fMRI Data Analysis with SPM and FSL
Module code psy275
ECTS credit points 6.0 KP
Workload 180 h
(Attendance: 56 h. (4 SWS), reading and practising: 124 h., total: 180 h.)
Used in degree programmes • Master Neurocognitive Psychology > Mastermodule
Contact person
module responsibility
» Riklef Weerda
» Peter Sörös
Prerequisites 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

Recommended reading

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 40
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

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<th>Examination</th>
<th>examination periods</th>
<th>Type of examination</th>
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<tr>
<td>Final exam of module</td>
<td>end of winter term</td>
<td>written exam (multiple choice)</td>
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<th>Comment</th>
<th>SWS</th>
<th>Offer rhythm</th>
<th>Workload attendance</th>
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<tr>
<td>Seminar</td>
<td></td>
<td>1</td>
<td>WinSem</td>
<td>14 h</td>
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<td>Exercises</td>
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<td>3</td>
<td>WinSem</td>
<td>42 h</td>
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</table>

Total attendance time of module 56 h
Psy280 - Transcranial Brain Stimulation

Module name: Transcranial Brain Stimulation
Module code: psy280
ECTS credit points: 6.0 KP
Workload: 180 h
Used in degree programmes: Master Neurocognitive Psychology > Mastermodule
Contact person: Christoph Siegfried Herrmann

Prerequisites: Enrolment in Master's programme Neurocognitive Psychology.

Skills to be acquired in this module
Goals of module:
Students will gain theoretical and practical knowledge on various non-invasive brain stimulation techniques.

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

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

Part 1: Introduction to transcranial brain stimulation (lecture)
- Historical overview of brain stimulation
- Different techniques (TMS, tDCS, tACS, tRNS)
- Physiological mechanisms (entrainment, after-effects etc.)
- The use of transcranial brain stimulation in cognitive neuroscience - Experimental parameters (intensity, electrode montage, etc.)
- Pros and cons of TMS vs. tACS
- Technical aspects (artifact correction, modeling current flow, etc.)
- Safety issues
- Ethical considerations of brain stimulation

Part 2: Effects of tACS on physiology and cognition (seminar)
- 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

Recommended reading

Links
Language of instruction: English
Duration (semesters): 1 semester
Module frequency: MM (Mastermodul / Master module)
Module capacity: 10

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

Lern-/Lehrform / Type of program
Part 1: lecture; Part 2: seminar
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<th>Examination</th>
<th>examination periods</th>
<th>Type of examination</th>
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<td><strong>Final exam of module</strong></td>
<td>during summer term</td>
<td>Oral presentation in the seminar.</td>
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<td><strong>Course type</strong></td>
<td><strong>Comment</strong></td>
<td><strong>SWS</strong></td>
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<tr>
<td>Lecture</td>
<td>2</td>
<td>SumSem</td>
</tr>
<tr>
<td>Seminar</td>
<td>2</td>
<td>SumSem</td>
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**Total attendance time of module**: 56 h
**Abschlussmodul**

*mam - Master´s Degree Module*

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<th>Master´s Degree Module</th>
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<tr>
<td>Module code</td>
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<tr>
<td>ECTS credit points</td>
<td>30.0 KP</td>
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<tr>
<td>Workload</td>
<td>900 h</td>
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<td></td>
<td>(attendance in the lab meetings: 28h (2 SWS); thesis work: 872 hours)</td>
</tr>
<tr>
<td>Used in degree programmes</td>
<td>Master Neurocognitive Psychology &gt; Abschlussmodul</td>
</tr>
<tr>
<td>Contact person</td>
<td></td>
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</table>

**Prerequisites**
- Enrolment in Master's programme Neurocognitive Psychology.
- Completion of at least 60 credit points in other modules.
- 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.

**Recommended reading**

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

**Language of instruction**
English

**Duration (semesters)**
1 semester

**Module frequency**
unlimited

**Module level**
Abschlussmodul (Abschlussmodul / Conclude)

**Modulart**
Pflicht / Mandatory

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

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

**Examination**

<table>
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<tr>
<th>Examination</th>
<th>examination periods</th>
<th>Type of examination</th>
</tr>
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<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>
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