Modulhandbuch Neurocognitive Psychology - Master-Studiengang

Datum 29/06/18

Mastermodule

psy110 - Research methods

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Research methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy110</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>12.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>360 h</td>
</tr>
<tr>
<td>Verwendet in Studiengängen</td>
<td></td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Martin Hecht</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master’s programme Neurocognitive Psychology.</td>
</tr>
</tbody>
</table>

Kompetenzziele

Goals of module:
Students will acquire 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

Modulinhalte

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)

Literaturempfehlungen

Links

Unterrichtssprache       English
Dauer in Semestern       2 Semester
Angebotsrhythmus Modul   The module will be offered every winter term.
Aufnahmekapazität Modul  unbegrenzt
<table>
<thead>
<tr>
<th>Modullevel</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>Parts 1 and 4: lectures; Parts 2 and 3: seminars; additional tutorials are offered.</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>basic statistics; otherwise please attend Introductory Course Statistics</td>
</tr>
<tr>
<td>Prüfung</td>
<td></td>
</tr>
<tr>
<td>Prüfungszeiten</td>
<td></td>
</tr>
<tr>
<td>Prüfungsform</td>
<td></td>
</tr>
</tbody>
</table>

| Gesamtmodul       | The module will be tested with an oral exam (20 min). Bonus for creating a script for the presentation on experimental stimuli in part 3. |

<table>
<thead>
<tr>
<th>Lehrveranstaltung</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</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>6.00</td>
<td>SuSe and WiSe</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>4.00</td>
<td>WiSe</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>0.00</td>
<td>SuSe and WiSe</td>
<td>0 h</td>
</tr>
</tbody>
</table>

| Präsenzzeit Modul insgesamt | 140 h |


psy120 - Psychological diagnostics

Modulbezeichnung: Psychological diagnostics
Modulcode: psy120
Kreditpunkte: 9.0 KP
Workload: 270 h

Verwendet in Studiengängen:
- Master Neurocognitive Psychology > Mastermodule

Ansprechpartner/-in
- Module responsibility: Andreas Hellmann
- Authorized examiners: Andreas Hellmann
- Module counseling: Stefan Debener

Teilnahmevoraussetzungen: Enrolment in Master's programme Neurocognitive Psychology.

Kompetenzziele:
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

Modulinhalte
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

Literaturrempfehlungen

Links
- Unterrichtssprache: English
- Dauer in Semestern: 2 Semester
- Angebotsrhythmus Modul: The module will be offered every winter term.
- Aufnahmekapazität Modul: unbegrenzt
- Modullevel: MM (Mastermodul / Master module)
- Modulart: Pflicht / Mandatory
**Lern-Lehrform / Type of program**

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

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>summer term</td>
<td>The module will be tested by a practical exercise (test application and protocol). Bonus for a presentation including test and attendance of at least 70% in the seminars.</td>
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</table>

**Lehrveranstaltungsform**

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>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</td>
<td>56 h</td>
</tr>
</tbody>
</table>

**Präsenzzeit Modul insgesamt**

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

**Modulbezeichnung**
Communication of scientific results

**Modulcode**
psy130

**Kreditpunkte**
6.0 KP

**Workload**
180 h

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

**Ansprechpartner/-in**
Module responsibility
- Christoph Siegfried Herrmann
Module counseling
- Daniel Strüber

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

**Kompetenzziele**
Goals of module:

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

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

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

Part 2: Psychological colloquium

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

**Literaturempfehlungen**

**Links**

**Unterrichtssprache**
English

**Dauer in Semestern**
1-2 Semester

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

**Aufnahmekapazität Modul**
unbegrenzt

**Hinweise**
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**

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsgestalt</th>
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</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>during winter term</td>
<td>The module requires an oral presentation that will be evaluated. Bonus for active participation (contribution to discussion, e.g. questions or comments) during the colloquium and attendance of at least 8 colloquium sessions.</td>
</tr>
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<tbody>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colloquium</td>
<td></td>
<td>2.00</td>
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</tr>
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</table>

| Präsenzzeit Modul insgesamt | 56 h |

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Psy140 - Minor

Modulebezeichnung
Minor

Modulcode
psy140

Kreditpunkte
9.0 KP

Workload
270 h

Verwendet in Studiengängen
- Master Neurocognitive Psychology > Mastermodule

Ansprechpartner/-in
Enrolment in Master's programme Neurocognitive Psychology.

Teilnahmevoraussetzungen
Enrolment in Master's programme Neurocognitive Psychology.

Kompetenzziele
Goals of module:
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.

Competencies:
++ interdisciplinary knowledge & thinking

Modulinhalte
Modules from the following fields can be taken without prior approval:

- Cellular and molecular biology
- Behavioural neurobiology
- Psychophysics and Audiology
- Artificial intelligence and knowledge representation
- Man machine interaction (not in combination with module psy220 Human Computer Interaction)
- Computational neuroscience
- Evolutionary biology
- Rehabilitation pedagogics (taught in German)
- Linear models
- General linear models and semiparametric models
- Philosophy (taught in German)
- German as a foreign language (for non-German students)

Literaturempfehlungen

Links

Unterrichtsprachen
English, German

Dauer in Semestern
1 Semester

Angebotsrhythmus Modul
unregelmäßig

Aufnahmekapazität Modul
unbegrenzt

Hinweise
PLEASE NOTE:
- If a course is not listed here, please request approval BEFORE you start the course
- Courses must be at Master's level (except language courses)
- Course descriptions need to state clear pass/fail criteria
- 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
- Content of the Minor courses need to be clearly different from other taken courses of the study program

Modullevel
MM (Mastermodul / Master module)

Modulart
Pflicht / Mandatory

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

Vorkenntnisse / Previous knowledge

Prüfung

Prüfungszeiten

Prüfungform

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

Lehrveranstaltungsform
Course or seminar

(Please refer to the module description for information on the courses you can have counted towards psy140 Minor.)
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<tbody>
<tr>
<td><strong>SWS</strong></td>
<td>0.00</td>
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<tr>
<td><strong>Angebotsrhythmus</strong></td>
<td>SuSe and WiSe</td>
</tr>
</tbody>
</table>
| **Workload Präsenzeit** | 0 h  
  *(Depends on the chosen course, but at least 14 hours attendance.)* |
psy150 - Clinical Psychology

Modulebezeichnung: Clinical Psychology
Modulcode: psy150
Kreditpunkte: 9.0 KP
Workload: 270 h

Verwendet in Studiengängen: Master Neurocognitive Psychology > Mastermodule

Ansprechpartner/-in: Module responsibility
  - Christiane Margarete Thiel

Teilnahmevoraussetzungen: Enrolment in Master’s programme Neurocognitive Psychology.

Kompetenzziele: 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

Modulinhalte: The first part of the module provides students with a theoretical and practical background on neurobiological and neurochemical bases of psychiatric disorders and pharmacological 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, hallucinogenic)
- 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

Literaturempfehlungen:
- Selected papers (part 2)

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

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

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<thead>
<tr>
<th>Lehrveranstaltungsform</th>
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<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</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>
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</table>

Präsenzzeit Modul insgesamt

84 h
### psy170 - Neurophysiology

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<th>Modulbezeichnung</th>
<th>Neurophysiology</th>
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<tr>
<td>Modulcode</td>
<td>psy170</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
</tbody>
</table>

#### Ansprechpartner/-in
- Module responsibility
  - Stefan Debener

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

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

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

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

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

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

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

#### Literaturempfehlungen

#### Links
**Unterrichtssprache**
- English

**Dauer in Semestern**
- 2 Semester

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

**Aufnahmekapazität Modul**
- 24 (The lecture is not restricted.)
**Hinweise**

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: theoretical-practical seminar; Part 3: theoretical-practical seminar; additional tutorial

**Vorkenntnisse / Previous knowledge**

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<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
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</thead>
<tbody>
<tr>
<td>Gesamtmodul</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>
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</table>

**Präsenzzeit Modul insgesamt** 56 h

<table>
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<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</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>Theorie-Praxis-Seminare</td>
<td>2 semester hours per week in second half of the winter term. 2 semester hours per week in summer term.</td>
<td>3.00</td>
<td>SuSe and WiSe</td>
<td>42 h</td>
</tr>
<tr>
<td>Tutorial</td>
<td>2 hours/week</td>
<td>0.00</td>
<td>SuSe</td>
<td>0 h</td>
</tr>
</tbody>
</table>
### psy181 - Neurocognition

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Neurocognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy181</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Christiane Margarete Thiel</td>
</tr>
</tbody>
</table>

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

**Kompetenzziele**
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

**Modulinhalte**
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

**Literaturempfehlungen**

**Links**
- Unterrichtssprache: English
- Angebotsrhythmus Modul: The module will be offered every winter term.
- Aufnahmekapazität Modul: 20 (Part 1 (lecture and seminar) are unrestricted, part 2 is restricted to 20 students.)
- Modullevel: MM (Mastermodul / Master module)
- Modulart: Wahlpflicht / Elective
- Lern-Lehrform / Type of program: Part 1: lecture and seminar; Part 2: seminar
- Vorkenntnisse / Previous knowledge: Part 1: lecture and seminar; Part 2: seminar
- Prüfungsform: The module will be tested with a written exam of 2 h duration on the contents of part 1.

Gesamtmodul: in the term holidays (usually March)
<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
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</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>1.00</td>
<td>WiSe</td>
<td>14 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>3.00</td>
<td>WiSe</td>
<td>42 h</td>
</tr>
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</table>

**Prüfung**

<table>
<thead>
<tr>
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<td>WiSe</td>
<td>42 h</td>
</tr>
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</table>

**Präsenzzeit Modul insgesamt** 56 h

Bonus for a presentation and participation in discussions on other presentations in the seminar.
### psy190 - Sex and Cognition

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Sex and Cognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy190</td>
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<tr>
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<tr>
<td>Workload</td>
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<td>Ansprechpartner/-in</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Daniel Strüber</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.</td>
</tr>
<tr>
<td>Kompetenzziele</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Competencies: ++ neuropsychological / neurophysiological knowledge + interdisciplinary knowledge &amp; thinking ++ data presentation &amp; discussion ++ scientific literature + critical &amp; analytical thinking ++ scientific communication skills + group work + project &amp; time management</td>
</tr>
</tbody>
</table>

#### Modulinhalte

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

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

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

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

#### Literaturempfehlungen


#### Links

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

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

Präsenzzeit Modul insgesamt 56 h
### psy200 - Neuropsychology

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Neuropsychology</th>
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<tbody>
<tr>
<td>Modulcode</td>
<td>psy200</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>9.0 KP</td>
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<tr>
<td>Workload</td>
<td>270 h</td>
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</table>

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

#### Ansprechpartner/-in
- Module responsibility
  - Stefan Debener

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

### Kompetenzziele
**Goals of module:**

Students will learn to understand changes in thinking and behaviour that may arise from brain dysfunctions (part 1, 4), acquire specific knowledge on 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

### Modulinhalte

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

#### Part 2: 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

### Literaturempfehlungen

### Links

### Unterrichtsprachen
- English, German

### Dauer in Semestern
- 2-3 Semester

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

### Aufnahmekapazität Modul
30
- Part 4 is not restricted.

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

### 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>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gesamtmodul</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>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</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>
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</table>

| Präsenzzeit Modul insgesamt | 112 h |
**psy210 - Applied Cognitive Psychology**

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Applied Cognitive Psychology</th>
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</thead>
<tbody>
<tr>
<td>Modulcode</td>
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<tr>
<td>Kreditpunkte</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
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<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Jochem Rieger</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.</td>
</tr>
</tbody>
</table>

**Kompetenzziele**

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

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

**Modulinhalte**

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

**Part 1: (Neuro)Cognitive Psychology in the wild I (lecture)**

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

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

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.

**Literaturempfehlungen**


**Links**

<table>
<thead>
<tr>
<th>Unterrichtssprache</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dauer in Semestern</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Angebotsrhythmus Modul</td>
<td>jährlich im Sommersemester (Vorlesung und Seminar laufen parallel)</td>
</tr>
<tr>
<td>Aufnahmekapazität Modul</td>
<td>30</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)</td>
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</table>

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
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</table>

**Gesamtmodul**

last class in summer term

The module will be evaluated with a written exam of...
<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungform</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2 hours duration. Bonus for a presentation (speech) and participation in discussions on other presentations in the seminar.</td>
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</table>

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

**Präsenzzeit Modul insgesamt** 56 h
**psy220 - Human Computer Interaction**

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

**Kompetenzziele**

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

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

**Modulinhalte**

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

**Part 1: Foundations of HCI and BCI (lecture)**
- Human information processing and models of human cognition (Perception, attention, memory, emotion and individual differences)  
- Computer interfaces for interaction  
- Data analysis techniques for brain machine interfacing (time series analysis, feature selection, classification)  
- Evaluation techniques

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

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

**Links**

<table>
<thead>
<tr>
<th>Unterrichtssprache</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dauer in Semester</td>
<td>2 Semester</td>
</tr>
<tr>
<td>Angebotsrhythmus Modul</td>
<td>The module will start every summer term with part 1. Part 2 will be offered in the winter term.</td>
</tr>
<tr>
<td>Aufnahmekapazität Modul</td>
<td>15</td>
</tr>
<tr>
<td>Hinweise</td>
<td>We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: practical course</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td></td>
</tr>
</tbody>
</table>
### Prüfung, Prüfungszeiten, Prüfungsform

| Gesamtmodul       | last lecture in summer term | 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>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Theorie-Praxis-Seminare</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
</tbody>
</table>

| Präsenzzeit Modul insgesamt | 56 h |
## psy230 - Neuromodulation of Cognition

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Neuromodulation of Cognition</th>
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<tbody>
<tr>
<td>Modulcode</td>
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<tr>
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<tr>
<td>Workload</td>
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<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Jochem Rieger</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.</td>
</tr>
<tr>
<td>Kompetenzziele</td>
<td>Goals of module:</td>
</tr>
<tr>
<td></td>
<td>The aim of this module is to provide students with a theoretical background on how cognitive functions can be altered via neuromodulation.</td>
</tr>
<tr>
<td></td>
<td>Competencies:</td>
</tr>
<tr>
<td></td>
<td>++ Neuropsychological / neurophysiological knowledge</td>
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<tr>
<td></td>
<td>+ interdisciplinary knowledge &amp; thinking</td>
</tr>
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<td></td>
<td>++ experimental methods</td>
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<td></td>
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<td></td>
<td>+ critical &amp; analytical thinking</td>
</tr>
<tr>
<td></td>
<td>+ scientific communication skills</td>
</tr>
<tr>
<td>Modulinhalte</td>
<td>Students will be introduced to the concepts of neuromodulation and the application of theoretical knowledge of neurophysiology to the modulation of cognitive functions.</td>
</tr>
<tr>
<td></td>
<td>Part 1: Neuromodulation of cognition (lecture)</td>
</tr>
<tr>
<td></td>
<td>• Neurotransmitter systems of cognition</td>
</tr>
<tr>
<td></td>
<td>• Neuropharmacological intervention</td>
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<td></td>
<td>• Neuroenhancement</td>
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<td></td>
<td>• Neurofeedback</td>
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<tr>
<td></td>
<td>• Neurostimulation</td>
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<td></td>
<td>Part 2: Neurofeedback (seminar)</td>
</tr>
<tr>
<td></td>
<td>• Neurofeedback in control and therapy</td>
</tr>
<tr>
<td></td>
<td>• EEG-Neurofeedback</td>
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<tr>
<td></td>
<td>• EMG-Neurofeedback</td>
</tr>
<tr>
<td></td>
<td>• Transcranial magnetic stimulation</td>
</tr>
<tr>
<td></td>
<td>• Deep brain stimulation</td>
</tr>
<tr>
<td></td>
<td>• Patient safety</td>
</tr>
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<td>Links</td>
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<tr>
<td></td>
<td>Dauer in Semestern: 1 Semester</td>
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<td>Angebotsrhythmus Modul: The module will be offered every winter term.</td>
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<td>Aufnahmekapazität Modul: 15</td>
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<td>Modulart: Wahlpflicht / Elective</td>
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<td></td>
<td>Lern-/Lehrform / Type of program: Part 1: lecture; Part 2: seminar</td>
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<td>Vorkenntnisse / Previous knowledge</td>
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<tr>
<td></td>
<td>Prüfung: during winter term</td>
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<tr>
<td></td>
<td>Prüfungszeiten: The module will be evaluated with an oral</td>
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<tr>
<td></td>
<td>Prüfungsform: during winter term</td>
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<table>
<thead>
<tr>
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<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
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</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>

| Präsenzzeit Modul insgesamt | 56 h |

presentation in the seminar. Bonus for oral contribution.
**psy241 - Computation in Neuroscience**

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Computation in Neuroscience</th>
</tr>
</thead>
<tbody>
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<td>Verwendet in Studiengängen</td>
<td>• Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>• Johannes Voßkuhl</td>
</tr>
<tr>
<td>Teilnahmevoraussetzungen</td>
<td>Enrolment in Master's programme Neurocognitive Psychology.</td>
</tr>
</tbody>
</table>

**Kompetenzziele**

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

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

**Modulinhalte**

### Part 1: Introduction to scientific programming I (theoretical-practical seminar)

- Basic data types and structures
- Flow control (conditions, loops, errors)
- Testing and debugging
- Functions

### Part 2: Introduction to scientific programming II (theoretical-practical seminar)

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

### Part 3: Scientific programming I (exercise)

- Implementation of examples from part 1

### Part 4: Scientific programming II (exercise)

- Implementation of examples from part 2

**Literaturempfehlungen**

- Mathworks (2009): MATLAB online documentation

**Links**

<table>
<thead>
<tr>
<th>Unterrichtssprache</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dauer in Semestern</td>
<td>2 Semester</td>
</tr>
<tr>
<td>Angebotsrhythmus Modul</td>
<td>The module will be offered every winter term.</td>
</tr>
<tr>
<td>Aufnahmekapazität Modul</td>
<td>unbegrenzt</td>
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<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: exercise; Part 4: exercise; additional tutorials</td>
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</tbody>
</table>
Vorkenntnisse / Previous knowledge

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsort</th>
<th>Prüfungsorte</th>
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</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>exam period at the end of the summer term</td>
<td></td>
<td></td>
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<tr>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzeit</th>
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</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>
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<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>

Präsenzzeit Modul insgesamt 84 h
psy250 - Internship

Modulbezeichnung | Internship
---|---
Modulcode | psy250
Kreditpunkte | 15.0 KP
Workload | 450 h

Verwendet in Studiengängen | Master Neurocognitive Psychology > Mastermodule
Ansprechpartner/-in | Module responsibility
| Corinna Kranczioch-Debener
| Hans Colonius

Teilnahmevoraussetzungen | Enrolment in Master's programme Neurocognitive Psychology.

Kompetenzziele | **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.

**Competencies:**
+ experimental methods
++ ethics / good scientific practice / professional behavior
++ knowledge transfer
+ project & time management

Modulinhalte | The students will work in a field of psychology and get to know the daily work routines of a psychologist.

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

Unterrichtsprachen | English , German

Dauer in Semestern | 1 Semester

Angebotsrhythmus Modul | unregelmäßig

Aufnahmekapazität Modul | unbegrenzt

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

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

Modullevel | MM (Mastermodul / Master module)

Modulart | Pflicht / Mandatory

Lern-Lehrform / Type of program | internship at (external) institution

Vorkenntnisse / Previous knowledge | 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.

Prüfung | individual
Prüfungsform | Gesamtmodul

Lehrveranstaltungsform | Practical

SWS | 0.00

Angebotsrhythmus | SuSe and WiSe

Workload Präsenzzeit | 0 h (450 h attendance at internship institution)
**psy260 - Practical project**

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Practical project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy260</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
</tbody>
</table>

**Ansprechpartner/-in**

- Hans Colonius
- Jochem Rieger
- Christoph Siegfried Herrmann
- Stefan Debener
- Jalenur Özyurt

**Module responsibility**

- Riklef Weerda

**Teilnahmevoraussetzungen**

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.

**Kompetenzziele**

Goals of module:

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

**Competencies:**

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

**Modulinhalte**

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

**Literaturrempfehlungen**

Links

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

**Unterrichtssprache**

English

**Dauer in Semestern**

1 Semester

**Angebotsrhythmus Modul**

The module will be offered every winter term.

**Aufnahmekapazität Modul**

unbegrenzt

**Hinweise**

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

Students can 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).

**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.
### Prüfung

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

<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrhythmus</th>
<th>Workload Präsenzzzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminar</td>
<td>Please select the group in which you perform your practical project.</td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Practical</td>
<td></td>
<td>2.00</td>
<td>WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Präsenzzzeit Modul insgesamt</td>
<td></td>
<td></td>
<td></td>
<td>56 h</td>
</tr>
</tbody>
</table>
### psy270 - Functional MRI Data Analysis

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Functional MRI Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy270</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
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<tr>
<td>Verwendet in Studiengängen</td>
<td>Master Neurocognitive Psychology &gt; Mastermodule</td>
</tr>
<tr>
<td>Ansprechpartner/-in</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Carsten Gießing</td>
</tr>
</tbody>
</table>

#### Kompetenzziele

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

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

#### Modulinhalte

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

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

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

#### Literaturempfehlungen


#### Hinweise

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

PLEASE NOTE:
We strongly recommend to take either psy170, psy270, 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-Lehrtart / Type of program

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

#### Vorkenntnisse / Previous knowledge

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>end of summer term</td>
<td>Oral or written examination</td>
</tr>
<tr>
<td>Lehrveranstaltungsform</td>
<td>Kommentar</td>
<td>angebotstypische Zahl</td>
</tr>
<tr>
<td>Lecture</td>
<td>2.00</td>
<td>SuSe</td>
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</table>
| Workload | 28 h | }
<table>
<thead>
<tr>
<th>Lehrveranstaltungsform</th>
<th>Kommentar</th>
<th>SWS</th>
<th>Angebotsrythmus</th>
<th>Workload Präsenzzeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminar</td>
<td></td>
<td>1.00</td>
<td>SuSe</td>
<td>14 h</td>
</tr>
<tr>
<td>Practical</td>
<td></td>
<td>4.00</td>
<td>SuSe</td>
<td>56 h</td>
</tr>
<tr>
<td><strong>Präsenzzeit Modul insgesamt</strong></td>
<td></td>
<td></td>
<td></td>
<td>98 h</td>
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</table>
**psy275 - Essentials of fMRI Data Analysis with SPM and FSL**

<table>
<thead>
<tr>
<th>Modulbezeichnung</th>
<th>Essentials of fMRI Data Analysis with SPM and FSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulcode</td>
<td>psy275</td>
</tr>
<tr>
<td>Kreditpunkte</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h (Attendance: 56 h. (4 SWS), reading and practising: 124 h., total: 180 h.)</td>
</tr>
</tbody>
</table>

Verwendet in Studiengängen
- Master Neurocognitive Psychology > Mastermodule

**Ansprechpartner/-in**
- Riklef Weerda
- Peter Sörös

**Teilnahmevoraussetzungen**
Enrolment in Master's programme Neurocognitive Psychology, 3rd semester or higher.

**Kompetenzziele**
- Neuropsychological / neurophysiological knowledge
- interdisciplinary knowledge & thinking
- experimental methods
- statistics & scientific programming
- data presentation & discussion
- independent research
- scientific literature
- ethics / good scientific practice / professional behaviour
- critical & analytical thinking
- group work

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

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

**Literaturempfehlungen**

**Links**

**Unterrichtssprache**
English

**Dauer in Semestern**
1 Semester

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

**Aufnahmekapazität Modul**
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**

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gesamtmodul</td>
<td>end of winter term</td>
<td>written exam (multiple choice)</td>
</tr>
<tr>
<td>Lehrveranstaltungsform</td>
<td>Kommentar</td>
<td>SWS</td>
</tr>
<tr>
<td>Seminar</td>
<td>1.00</td>
<td>WiSe</td>
</tr>
<tr>
<td>Exercises</td>
<td>3.00</td>
<td>WiSe</td>
</tr>
<tr>
<td>Präsenzzeit Modul insgesamt</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**psy280 - Transcranial Brain Stimulation**

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

**Modulinhalte**

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

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

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

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

- 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

**Literaturempfehlungen**


**Links**

<table>
<thead>
<tr>
<th>Unterrichtssprache</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dauer in Semestern</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Angebotsrhythmus Modul</td>
<td>The module will be offered every summer term.</td>
</tr>
<tr>
<td>Aufnahmekapazität Modul</td>
<td>10</td>
</tr>
<tr>
<td>Hinweise</td>
<td>We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, IMRI, TBS, HCI) that are needed for most practical projects and Master’s thesis!</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td>Lern-/Lehrform / Type of program</td>
<td>Part 1: lecture; Part 2: seminar</td>
</tr>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
<td>Prüfung</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Gesamtmodule</td>
<td>during summer term</td>
</tr>
<tr>
<td>Lehrveranstaltungsform</td>
<td>Kommentar</td>
</tr>
<tr>
<td>Lecture</td>
<td>2.00</td>
</tr>
<tr>
<td>Seminar</td>
<td>2.00</td>
</tr>
<tr>
<td>Präsenzzeit Modul insgesamt</td>
<td></td>
</tr>
</tbody>
</table>
Abschlussmodul

mam - Masterabschlussmodul

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

Verwendet in Studiengängen
- Master Neurocognitive Psychology > Abschlussmodul

Teilnehmervoraussetzungen
- enrolment in Master’s programme Neurocognitive Psychology.
- completion of at least 60 credit points in other modules.
- assignment of a topic by first thesis supervisor and official application with the examination office.

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

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

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

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

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

Unterrichtssprache
English

Dauer in Semestern
1 Semester

Aufnahmekapazität Modul
unbegrenzt

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

Modulevel
Abschlussmodul (Abschlussmodul / Conclude)

Modulart
Pflicht / Mandatory

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

Vorkenntnisse / Previous knowledge
contact your supervisor for details

<table>
<thead>
<tr>
<th>Prüfung</th>
<th>Prüfungszeiten</th>
<th>Prüfungsort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gesamtmodul</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>

Lehrveranstaltungsort
Seminar und Projekt

SWS
2.00

Angebotsrhythmus
SuSe
Workload Präsenzzeit

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