CARL VON OSSIETZKY universität OLDENBURG
FAKULTÄT VI
MEDIZIN UND GESUNDHEITSWISSENSCHAFTEN

DEPARTMENT OF PSYCHOLOGY
CARL VON OSSIETZKY UNIVERSITY OLDENBURG

Handbook of modules and study plan

for the

Research Master programme

Neurocognitive Psychology

Date: July, 2020

Introduction:

The Handbook of modules lists all modules of the MSc programme *Neurocognitive Psychology*. Each module description gives the following information:

- Name of the module
- Goals of the module
- Contents of the module
- The teaching methods of the module
- Requirements for participation within a module
- The effort for the student
- The number of credit points
- The method of assessment
- The person responsible

The research-oriented study programme is composed of four parts. The general part contains five mandatory modules comprising 45 CP. The specialized part contains 10 modules from which students are free to choose at least three with a total of 24 CP. The programme lasts two years or four semesters during which a total of 120 CP must be achieved. This includes 12 CP for an internship lasting 360 hours and 30 CP for completing the Master’s thesis with the accompanying Master’s colloquium. Another 9 CP must be acquired via a practical research project which can be carried out in one of the Psychology labs at the University of Oldenburg or an external research group. The programme is designed in a modular fashion. The study structure offers increased flexibility to the students in the second half of their studies.

Please be aware that we strongly advise to attend at least one of the four modules psy170: Neurophysiology, psy270: fMRI Data Analysis, psy220: Human Computer Interaction, and psy280: Transcranial Brain Stimulation! Knowledge of either EEG, fMRI, HCI or TBS is essential for most practical projects and Master’s theses offered in the Department of Psychology.

Work with patients or experimental data acquisition with participants generally require a good command of German! Non-mandatory classes from clinicians are (partly) given in German. You can take German courses as your Minor.

Overview:

The Master’s programme *Neurocognitive Psychology* has the following structure:

General part (mandatory):		**45 CP**
psy110	Research methods	12 CP
psy121	Psychological Assessment and Diagnostics	12 CP
psy130	Communication of scientific results	6 CP
psy141	Minor	6 CP
psy240	Computation in Neuroscience	9 CP
Specialized part (choose 24 CP; taking psy170, psy270, psy220 or psy280 is strongly recommended):		**24 CP**
psy150	Clinical Psychology (partly in German)	9 CP
psy170	Neurophysiology	6 CP
psy181	Neurocognition	6 CP
psy190	Sex and Cognition	6 CP
psy201	Neuropsychology (partly in German)	6 CP
psy210	Applied Cognitive Psychology	6 CP
psy220	Human Computer Interaction	6 CP
psy230	Neuromodulation of Cognition	6 CP
psy270	Functional MRI Data Analysis	9 CP
psy280	Transcranial Brain Stimulation	6 CP
Practical part (mandatory):		**51 CP**
psy251	Internship or lab visit	12 CP
psy260	Practical project	9 CP[1]
mam	Master’s thesis (27 CP) and Master’s colloquium (3 CP)	30 CP
Total:		**120 CP**

[1] Chose from Applied Neurocognitive Psychology, Biological Psychology, Psychological Methods and Statistics, Experimental Psychology, Neuropsychology

Restriction in participant numbers apply for each elective module. There is no guarantee that students can take all modules of their choice.

Module structure Research Master Neurocognitive Psychology (valid from winter term 2020)

Semester	Module						credit points
4	**mam** Master's thesis and colloquium, 30 CP				voluntary courses LaTeX / Academic Writing 0 CP	Continue: **psy181** Neurocognition- 2, 3 CP	30 CP compulsory max. 3 CP elective
	Mobility window for **psy251** Internship, 12 CP (semester break between 3. and 4. semester)[6]						max. 12 CP compulsory
Mobility window to study abroad (January until June)[8]							
3	**psy141** Minor, 6 CP[7]		**psy260** Practical Project, 9 CP		Choose from: **psy181** Neurocognition- 1, 3 CP **psy190** Sex and Cognition- 1 & 2, 6 CP **psy230** Neuromodulation of Cognition- 1 & 2, 6 CP	Continue: **psy150** Clinical Psychology- 1[4], 6 CP **psy210** Applied Cognitive Psych.- 2, 3 CP	15 CP compulsory max. 33 CP elective
	Mobility window for **psy251** Internship, 12 CP (semester break between 2. and 3. semester)[6]						max. 12 CP compulsory
2	**psy110** Research methods- 3 & 4, 6 CP	**psy121** Psychol. Assess. & Diagnostics- 3 & 4, 6 CP	**psy130** Communication of scientific results- 2[1], (3 CP)	**psy240** Computation in Neuroscience- 3, 4, 5, 6 CP	Continue: **psy150** Clinical Psychology- 2[3], 3 CP **psy170** Neurophysiology- 3, 3 CP **psy201** Neuropsychology[2]- 2, 3 CP	Choose from: **psy210** Applied Cognitive Psych.- 1, 3 CP **psy220** Human Computer Interaction- 1 & 2, 6 CP **psy270** Functional MRI Data Analysis[5], 9 CP **psy280** Transcranial Brain Stimulation- 1 & 2, 6 CP	18 CP compulsory max. 33 CP elective
1	**psy110** Research methods- 1 & 2, 6 CP	**psy121** Psychol. Assess. & Diagnostics- 1 & 2 6 CP	**psy130** Communication of scientific results- 1 & 2[1], (3 CP or) 6 CP	**psy240** Computation in Neuroscience- 1 & 2, 3 CP	Choose from: **psy150** Clinical Psychology- 1[4], 6 CP **psy170** Neurophysiology- 1 & 2, 3 CP **psy201** Neuropsychology[2]-1 & 3[3], 3 CP or 6 CP	voluntary course Introductory course statistics 0 CP	21 CP compulsory max. 15 CP elective
	General part compulsory modules 45 CP in total	**Practical part** research modules internship compulsory 51 CP in total	**Specialized part** elective modules choose 24 CP in total				total: 120 CP in 4 semesters

You should aim to study 30 +/- 3 credit points per semester. 1 CP equals 30 hours of work including preparation outside class.

[1] This module part can be taken during the 1st and/or 2nd semester.
[2] For module psy201 part 1 is mandatory; choose between part 2 and 3.
[3] This module part is (partly) taught in German. Accompanying English material will be available.
[4] This module part can be taken during the 1st or 3rd semester.
[5] Module psy270 is blocked over 7 weeks in the second half of the term.
[6] The internship lasts 360h and can be performed any time that fits your study plan. You may split the internship.
[7] Module psy141 can be studied in any semester. You will chose Master classes of your interest outside or inside the Department of Psychology.
[8] For the Research Master Neurocognitive Psychology we recommend performing research internships abroad.
If you want to study abroad, please contact the programme coordinator as early as possible to discuss your individual study plan.

Learning outcomes and competencies Research Master Neurocognitive Psychology

			skills / competencies													
			expert neuropsychological / neurophysiological knowledge	interdisciplinary kowledge & thinking	experimental methods	statistics & scientific programming	data presentation & discussion	independent research	scientific literature	scientific English / writing	ethical evaluation / good scientific practice / professional behaviour	critical & analytical thinking	scientific communication skills	knowledge transfer	group work	project & time management
modules (mandatory / elective)	psy110	Research Methods		++		++	++	+	+		++	++	++		+	
	psy121	Psychological Assessment & Diagnostics	+	+							+	+				
	psy130	Comminucation of Scientific Results					++		++	++			++		+	
	psy141	Minor		++												
	psy150	Clinical Psychology	++		+		+		+			+		+		
	psy170	Neurophysiology	++		++	++					++				+	+
	psy181	Neurocognition	++	++			++		++				+		+	
	psy190	Sex and Cognition	++	+			++		++			+	++		+	+
	psy201	Neuropsychology	++	+	++		+		++			+	+			
	psy210	Applied Cognitive Psychology	++	+	+				+		+	+	+	+		
	psy220	Human Computer Interaction	++	++	+	++						+	+	+	+	+
	psy230	Neuromodulation of Cognition	++	+	++						+	+	+			
	psy240	Computation in Neuroscience	+		+	++						+		+	+	
	psy251	Internship	++	+	+						++			++		+
	psy260	Practical Project			++	+	++	+	+		+		+	+	+	++
	psy270	Funtional MRI Data Analysis			++	++	+								++	
	psy280	Transcranial Brain Stimulation	++		++	+			+		+					
	Mam	Master's thesis			++	+	+	++	+	++	+	+	+	+		++

Modules for Neurocognitive Psychology

Date 07/05/20

Mastermodule

psy110 - Research methods

Module label	Research methods
Module code	psy110
Credit points	12.0 KP
Workload	360 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Andrea Hildebrandt Authorized examiners ◦ Andrea Hildebrandt
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will acquire basic knowledge in planning empirical investigations, managing and understanding quantitative data and conducting a wide variety of multivariate statistical analyses. They will learn how to use the statistical methodology in terms of good scientific practice and how to interpret, evaluate and synthesize empirical results from the perspective of statistical modeling and statistical learning in basic and applied research context. The courses in this module will additionally point out statistical misconceptions and help students to overcome them. **Competencies:** ++ interdisciplinary kowledge & thinking ++ statistics & scientific programming ++ data presentation & discussion + independent research + scientific literature ++ ethics / good scientific practice / professional behavior ++ critical & analytical thinking ++ scientific communication skills + group work
Module contents	**Part 1: Multivariate Statistics I (lecture): winter** • Graphical representation of multivariate data • The Generalized Linear Modeling (GLM) framework • Multiple and moderated linear regression with quantitative and qualitative predictors • Logistic regression • Multilevel regression (Generalized Linear Mixed Effects Modeling – GLMM) • Non-linear regression models • Path modeling • Factor analysis (exploratory & confirmatory) • (Multilevel) Structural equation modeling (SEM linear and non-linear) **Part 2: Analysis Methods with R (seminar): winter and summer** • Data examples and applications of GLM, GLMM, polynomial, spline and local regression, path modeling, factor analyses and SEM **Part 3: Multivariate Statistics II (lecture): summer** • Supervised and unsupervised statistical learning and prediction • Regularized regression • Resampling methods • Tree-based methods • Support Vector Machines

- Neural Networks (basics)
- Principal components and clustering

Part 4: Evaluation research (seminar): summer

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

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

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

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		4.00	SuSe and WiSe	56 h
Seminar	R seminar in summer is voluntary	4.00	SuSe and WiSe	56 h
Tutorial	statistics	0.00	SuSe and WiSe	0 h
Total time of attendance for the module				112 h

psy121 - Psychological assessment and diagnostics

Module label	Psychological assessment and diagnostics
Module code	psy121
Credit points	12.0 KP
Workload	360 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Andrea Hildebrandt Authorized examiners ◦ Andrea Hildebrandt ◦ Andreas Hellmann Module counceling ◦ Stefan Debener
Entry requirements	
Skills to be acquired in this module	**Goals of module:** Students will acquire specific knowledge about psychological assessment and will be trained to utilize this knowledge within a research context and in applied settings. With respect to research applications they will learn about traditional and modern test theories and about their usage in the domain of test construction and the systematic design of interviews and observational methods. From the perspective of applied assessment, students will reflect on the assessment process as a whole. They will learn how to analyze cases (“case conceptualization”), how to plan and conduct the information assessment phase, how to record and summarize collected data and how to integrate across the multitude of information in order to draw conclusions about the case given specific diagnostic strategies (status vs. process assessment and norm oriented vs. criterion oriented assessment, including classificatory decisions). Finally, students will learn about the requirements of report generation in written an oral form given a specific applied context. Ethical guidelines and quality norms will be an implicit topic in all courses in the module. **Competencies:** + Neuropsychological / neurophysiological knowledge + interdisciplinary kowledge & thinking + ethics / good scientific practice / professional behavior + critical & analytical thinking
Module contents	**Part 1: Introduction to Psychological Assessment (lecture): winter** • Psychological assessment as a decision process – descriptive and prescriptive models • Introduction to test theories (will be detailed in Part 3) • Assessment methods, their construction and design, quality criteria • The logic of decision making in the assessment process • Classificatory decisions • Psychometrics to single cases • Summarizing results and writing reports **Part 2: The Assessment Process applied (seminar): winter** • Case conceptualization (neuropsychology and clinical psychology) • Formulating hypotheses • Selecting assessment procedures and planning administration • Deciding upon decision rules for data integration • Evaluating the application of assessment procedures • Analyzing, summarizing and visualizing results • Integrating results based on the decision rules • Writing a psychological/assessment report • Discussing a report with the client **Part 3: Test theory and test construction (lecture): summer** • Classical test theory • Generalizability theory • Item response theory • Latent-State and Trait theory • Measurement invariance across groups and time • Constructing faking-resistant questionnaires and tests **Part 4: Assessment in Clinical Neuropsychology (seminar): summer** • specific knowledge • exercises in testing / practising tests
Reader's advisory	Will be specified in the courses.
Links	

Language of instruction	English
Duration (semesters)	2 Semester
Module frequency	The module will start every winter term.
Module capacity	unlimited
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Pflicht / Mandatory
Modulart	Pflicht / Mandatory
Lern-/Lehrform / Type of program	Part 1 and 3: 2 lectures ; Part 2 and 4: seminars
Lern-/Lehrform / Type of program	Part 1 and 3: 2 lectures ; Part 2 and 4: seminars
Vorkenntnisse / Previous knowledge	You should know basic statistical concepts as they are also covered in the introductory course statistics.

Examination	Time of examination	Type of examination
Final exam of module	summer term	The module will be tested by a practical exercise (test application and protocol) 90% and an oral presentation of the planned contents 10%. Required active participation for gaining credits: • 2 presentations or test executions • handing in 10 excercises • participation in discussions on other presentations • attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		4.00	SuSe and WiSe	56 h
Seminar		4.00	SuSe and WiSe	56 h
Total time of attendance for the module				112 h

psy130 - Communication of scientific results

Module label	Communication of scientific results
Module code	psy130
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Christoph Siegfried Herrmann Authorized examiners ◦ Christoph Siegfried Herrmann ◦ Florian Kasten ◦ Daniel Strüber Module counceling ◦ Daniel Strüber
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will acquire specific knowledge about the presentation of scientific results both orally and in writing. Students will learn modern techniques for presentation, literature research and writing skills. They will also be taught about arguing scientifically. **Competencies:** ++ data presentation & discussion ++ scientific literature ++ scientific English / writing ++ scientific communication skills + group work
Module contents	**Part 1: Communication of scientific results (seminar)** Literature search Presentation skills Writing skills **Part 2: Psychological colloquium** Experienced scientists from various psychological disciplines will be giving talks about their experimental results. Speakers will be invited also from other universities. Students are encouraged to discuss the results with the experts and to make suggestions on whom to invite
Reader's advisory	- Sternberg, Robert (2000) Guide to Publishing in Psychology Journals, Cambridge University Press
Links	
Language of instruction	English
Duration (semesters)	1-2 Semester
Module frequency	Part 1 will be offered every winter term. Part 2 will be offered every semester.
Module capacity	unlimited
Reference text	Students can chose whether they want to attend the colloquium in the first, second or both semesters.
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Pflicht / Mandatory
Modulart	Pflicht / Mandatory
Lern-/Lehrform / Type of program	Communication of scientific results: seminar; Psychological colloquium: colloquium
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	during winter term	Oral presentation

Examination	Time of examination	Type of examination
		Required active participation for gaining credits: 70% attendance of the seminar and at least 8 colloquia (use attendance sheet that will be handed out in the beginning of the term) and active discussion in at least 1 colloqium.

Course type	Comment	SWS	Frequency	Workload attendance
Seminar		2.00	WiSe	28 h
Colloquium		2.00	SuSe and WiSe	28 h
Total time of attendance for the module				56 h

psy141 - Minor

Module label	Minor
Module code	psy141
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module counceling ◦ Jochem Rieger ◦ Kerstin Bleichner
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will gain an overview of non-psychological topics related to cognitive neuroscience and neuropsychology. They will see how psychological theories apply in other fields. Students can strengthen their own professional profile. **Competencies:** ++ interdisciplinary kowledge & thinking
Module contents	Students can take Master modules and courses from the fields • Biology • Neurosciences • Computer Science • Physics • Mathematics • Pedagogy • Philosophy • related fields • Psychology (additional elective module (NOT psy170, psy220, psy270, psy280) or from another study programme) Students whose first language is not German, may take German classes. Upon approval, German-speaking students can attend a career-relevant language course (i.e. necessary for internship, practical project or Master's thesis). English classes cannot be taken as Minor. A list of already approved courses/modules can be found on our website. You can take other courses/modules upon approval. **We recommend taking modules/courses that strengthen your own professional profile.**
Reader's advisory	
Links	List of approved courses/modules and approval form: https://uol.de/en/psychology/master/course-overview/ -> Supporting documents
Languages of instruction	English , German
Duration (semesters)	1 Semester
Module frequency	irregular
Module capacity	unlimited
Reference text	PLEASE NOTE: If you want to take a module/course which is not listed in the list of approved courses/modules, please request approval BEFORE you start the course/module (list of approved courses/modules and approval form can be found on our website) If you want to take an additional elective module for your Minor (taking only a part of an elective module is not possible), you need to inform the contact person for the respective module in writing BEFORE the start of the module. If your request is NOT rejected in written form within 4 weeks, the module counts as

	approved for the Minor. You will receive a pass/fail for this module. You CANNOT use it afterwards as a normal elective module. You can also NOT rededicate an elective that you have already started as your Minor. Bachelor level courses are NOT acceptable. Note that Bachelor level courses can be listed in some Master programmes (e.g. Master of Education). This does not qualify a Bachelor level course for the Minor module. It is your responsibility to ask the teacher whether you can take part.	
Modullevel	MM (Mastermodul / Master module)	
Modullevel	MM (Mastermodul / Master module)	
Modulart	Pflicht / Mandatory	
Modulart	Pflicht / Mandatory	
Lern-/Lehrform / Type of program	Lectures and seminars (depends on the chosen modules)	
Lern-/Lehrform / Type of program	Lectures and seminars (depends on the chosen modules)	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module		If grades are earned in the minor, those are counted as pass/fail. Certificates for grades can be separately requested from the examination office.
Course type	VA-Auswahl	
SWS	4.00	
Frequency	SuSe or WiSe	
Workload attendance	56 h	

psy150 - Clinical Psychology

Module label	Clinical Psychology
Module code	psy150
Credit points	9.0 KP
Workload	270 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Christiane Margarete Thiel Authorized examiners ◦ Christiane Margarete Thiel
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of the Module:** Students acquire scientifically sound, critical thinking regarding the genesis and psychopharmacological treatment of various mental illnesses; decision making based on the medical guidelines and evidence-based practice. **Competencies:** ++ Neuropsychological / neurophysiological knowledge + experimental methods + data presentation & discussion + scientific literature + critical & analytical thinking + knowledge transfer
Module contents	The first part of the module provides students with a theoretical and practical background on neurobiological and neurochemical bases of psychiatric disorders and pharmacological interventions. This will be complemented by psychiatric interviews in simulated patients focussing on psychopathological assessment. In the second part, the students will learn to plan and assess the effectiveness of psychological interventions for selected disorders. **Part 1: Neurobiological basis of psychiatric disorders and pharmacological intervention (lecture and seminar): winter** Basics of neurotransmitter systems and psychopharmacology Substance Abuse (e.g. psychostimulants, hallucinogenics) Depression Anxiety Disorders Alzheimer's Disease Schizophrenia psychopathological assessment **Part 2: Psychological interventions within the framework of evidence-based medicine (seminar): summer** (partly in German): Concepts of evidence based treatment and treatment of acquired dysfunctions of the brain Treatment of selected psychiatric disorders
Reader's advisory	• Meyer, J.S. & Qenzer, L.F. (2013) Psychopharmacology: Drugs, the Brain and Behaviour. Sunderland, MA: Sinauer Associates. (part 1) • Kring, A.M, Johnson, S.L., Davison, G.C., & Neale, J.M., (2012) Abnormal Psychology. John Wiley & Sons (12th ed) (introductory literature) • Selected papers (part 2)
Links	

Languages of instruction	English , German
Duration (semesters)	2 Semester
Module frequency	Part 1 will be offered every winter term, part 2 every summer term.
Module capacity	unlimited
Reference text	Please note: Parts of this module will be taught in German with accompanying English materials. To follow all parts of this module, students need to be able to follow a lecture in German. Presentations can be given in English.
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Modulart	Pflicht / Mandatory
Lern-/Lehrform / Type of program	Part 1: lecture and seminar: part 2: seminar
Lern-/Lehrform / Type of program	Part 1: lecture and seminar: part 2: seminar
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	mid-February	The module will be tested with a written exam (2 h) on the contents of part 1. Required active participation for gaining credits: 1 presentation participation in discussions on other presentations attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00	WiSe	28 h
Seminar		4.00	SuSe and WiSe	56 h
Total time of attendance for the module				84 h

psy170 - Neurophysiology

Module label	Neurophysiology
Module code	psy170
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Stefan Debener Authorized examiners ◦ Stefan Debener
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will understand the basic concepts of biomedical signal processing. They will use EEG analysis tools interactively and independently and will understand the complete chain of EEG analysis steps, from data import to the illustration of results. They will be able to use open source tools for EEG analysis and apply theoretical knowledge to practical problems of physiology. **Competencies:** ++ Neuropsychological / neurophysiological knowledge ++ experimental methods ++ statistics & scientific programming ++ ethics / good scientific practice / professional behavior + group work + project & time management
Module contents	Students will acquire specific knowledge about neurophysiology and neuroanatomy, learn the fundamental concepts of multi-channel EEG analysis, and acquire hands-on skills in using EEGLAB, an open-source software toolbox for advanced EEG analysis. **Part 1: Neurophysiology and neuroanatomy (lecture): winter** Neurophysiology, EEG, EMG, ECG Neuroanatomy Time-domain and frequency-domain analysis methods **Part 2: EEG recording and analysis (seminar): winter** Recording and analysis of biomedical signals Averaging, filtering, signal-to-noise Topographical EEG analysis **Part 3: EEG analysis with Matlab (seminar): summer** EEGLAB file I/O, data structure and scripting Preprocessing, artefact rejection and artefact correction Statistical decomposition Event-related potentials, topographical mapping and power spectra Illustration of results
Reader's advisory	• Kandel et al. (2000). Principles of Neural Science, McGraw-Hill • Luck, S.J. (2005). An Introduction to the ERP Technique, The MIT Press • Van Drongelen, W. (2006). Signal Processing for Neuroscientists, Academic Press
Links	
Language of instruction	English

Duration (semesters)	2 Semester
Module frequency	The module will start every winter term.
Module capacity	18 (The lecture is not restricted.)
Reference text	PLEASE NOTE: We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2 and 3: seminars
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2 and 3: seminars
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	exam period at the end of the summer term	The module will be tested with a written exam of 2 h duration. Required active participation for gaining credits: recording of electroencephalographic data attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture	2 semester hours per week in first half of the winter term.	1.00	WiSe	14 h
Seminar	2 semester hours per week in second half of the winter term. 2 semester hours per week in summer term.	3.00	SuSe and WiSe	42 h
Total time of attendance for the module				56 h

psy181 - Neurocognition

Module label	Neurocognition
Module code	psy181
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Christiane Margarete Thiel Authorized examiners ◦ Christiane Margarete Thiel
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students should be able to recognize and critically evaluate the value of considering neuroscience in the study of psychological topics. **Competencies:** ++ neuropsychological / neurophysiological knowledge ++ interdisciplinary kowledge & thinking ++ data presentation & discussion ++ scientific literature + scientific communication skills + group work
Module contents	Students will first acquire a general understanding of the brain mechanisms of different cognitive functions and the methods used to study these functions. They will then apply this knowledge by discussing current research topics (part 1). General knowledge will be focused on the relation between the development of the human brain and the cognitive processes it supports (part 2). **Part 1: Introduction to cognitive neuroscience (lecture and seminar): winter** Brain and cognition, methods of cognitive neuroscience Attention, learning and memory Emotional and social behaviour Language, executive functions **Part 2: Neurocognitive development (seminar): summer** Brain development and cortical plasticity Effects of early-life stress on brain development Development of object recognition, social cognition, memory, and executive functions
Reader's advisory	• Ward (2015) The Student's Guide to Cognitive Neuroscience, Psychology Press • Nelson, Haan & Thomas (2006) Neuroscience of Cognitive Development: The Role of Experience and the Developing Brain, Wiley & Sons • Johnson (2011) Developmental Cognitive Neuroscience, 3rd ed., Wiley-Blackwell.
Links	
Language of instruction	English
Duration (semesters)	2 Semester
Module frequency	The module will be offered every winter term.
Module capacity	20 (Part 1 (lecture and seminar) are unrestricted, part 2 is restricted to 20 students.)

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

Examination	Time of examination	Type of examination
Final exam of module	mid-February	The module will be tested with a written exam of 2 h duration on the contents of part 1. Required active participation for gaining credits: 1 presentation participation in discussions on other presentations attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		1.00	WiSe	14 h
Seminar		3.00	WiSe	42 h
Total time of attendance for the module				56 h

psy190 - Sex and Cognition

Module label	Sex and Cognition
Module code	psy190
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Daniel Strüber Authorized examiners ◦ Daniel Strüber
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.
Skills to be acquired in this module	**Goals of module:** Students will acquire specific knowledge about sex differences in cognitive abilities and social behaviours. They will be able to understand the interrelated impact of social and biological influences on the brain's control of the (sex-specific) behaviours. Students should be able to critically evaluate behavioural sex differences from different perspectives and to reflect on possible implications for society. **Competencies:** ++ neuropsychological / neurophysiological knowledge + interdisciplinary kowledge & thinking ++ data presentation & discussion ++ scientific literature + critical & analytical thinking ++ scientific communication skills + group work + project & time management
Module contents	Inhalte **Part 1: Introduction to the study of sex differences (lecture): winter** The measurement of sex differences Sex differences in emotion Sex differences in aggression Sex differences in cognitive abilities Hormones, sexual differentiation, and gender identity Sex hormones and play preferences Sex differences in hemispheric organization Brain size and intelligence **Part 2: Sex, brain, and behaviour (seminar): winter** Sex differences in empathy The extreme male brain theory of autism (S. Baron-Cohen) Sex differences in neuropsychiatric disorders Sex differences in stress response Social implications of sex differences
Reader's advisory	• Diane F. Halpern (2000) Sex Differences in Cognitive Abilities, Lawrence Erlbaum Associates • Doreen Kimura (2000) Sex and Cognition, MIT Press • Melissa Hines (2004) Brain Gender, Oxford University Press • Richard A. Lippa (2005) Gender, Nature, and Nurture, Lawrence Erlbaum Associates

Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	The module will be offered every winter term.
Module capacity	30
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	during winter term	oral presentation Required active participation for gaining credits: participation in discussions on other presentations attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00	WiSe	28 h
Seminar		2.00	WiSe	28 h
Total time of attendance for the module				56 h

psy201 - Neuropsychology

Module label	Neuropsychology
Module code	psy201
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Stefan Debener Authorized examiners ◦ Stefan Debener
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will learn to understand changes in thinking and behaviour that may arise from brain dysfunctions (part 1, 3), acquire specific knowledge on cognitive rehabilitation (part 2), and learn to understand, communicate and evaluate progress in clinical practice and experimental research in neuropsychology (part 3). **Competencies:** ++ neuropsychological / neurophysiological knowledge + interdisciplinary kowledge & thinking ++ experimental methods + data presentation & discussion ++ scientific literature + critical & analytical thinking + scientific communication skills
Module contents	**Part 1: Introduction to Clinical Neuropsychology (lecture): winter** Cortical lobes (anatomy, functions, lesion symptoms, neuropsychological tests) Higher functions (learning & memory, language, emotion, spatial behavior attention) Plasticity and disorders (development, learning and reading disabilities, recovery) **Part 2: Cognitive Neurorehabilitation (seminar): summer** Behavioural and neuropsychological approaches neurofeedback in neurorehabilitation and ADHD memory rehabilitation effects of physical activity on cognition motor recovery **Part 3: Topics in Clinical Neuropsychology (seminar; taught partly in German): winter** Clinical neuroanatomy Neurodegenerative diseases Dementia Choose either part 2 or part 3!
Reader's advisory	
Links	
Language of instruction	English
Duration (semesters)	1-2 Semester
Module frequency	The module will start every winter term.
Module capacity	30 (Part 3 is not restricted.)
Reference text	Part 1 (lecture) is mandatory. Choose either part 2 or part 3 (seminars). Note: The lecture of part 3 is given in German with accompanying English materials. Students who cannot follow a lecture in German are given priority in part 2.
Modullevel	MM (Mastermodul / Master module)

Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar; Part 3: seminar
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar; Part 3: seminar
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	exam period at the end of winter term	The module will be tested with a written exam of 2 h duration. Required active participation for gaining credits: presentation participation in discussions on other presentations attendance of at least 70% in the seminars (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00	WiSe	28 h
Seminar		2.00	SuSe or WiSe	28 h
Total time of attendance for the module				56 h

psy210 - Applied Cognitive Psychology

Module label	Applied Cognitive Psychology
Module code	psy210
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Jochem Rieger Authorized examiners ◦ Jochem Rieger
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.
Skills to be acquired in this module	**Goals of the module:** Students will gain an overview of theories of (Neuro)Cognitive Psychology with potential for application. On completion of this module students should have a repertoire of cognitive psychology concepts relevant for real world situations, be able to transfer the learned theoretical concepts into practical contexts and evaluate potential issues arising in the process of translation. **Competencies:** ++ Neuropsychological / neurophysiological knowledge + interdisciplinary kowledge & thinking + experimental methods + scientific literature + ethics / good scientific practice / professional behavior + critical & analytical thinking + scientific communication skills + knowledge transfer
Module contents	The module will cover core concepts of cognitive psychology, their neuronal basis, basic knowledge of neuroimaging and data analysis techniques. Special emphasis will be put on research aiming at complex real-world settings and translation of basic science in to practice. Examples of successful transfers will be analyzed. The lecture provides the theoretical basis. In the seminar the material is consolidated by examples from the literature which will be presented, critically analyzed and discussed. **Part 1: (Neuro)Cognitive Psychology in the wild I (lecture): summer** • Neurocognitive Psychology with emphasis in real world context • Methodological considerations: Generalization, validity of theories and research methods • Information uptake and representation: Sensation, perception, categorization • Selection of information and capacity: Attention and memory enhancement and failure • Generation and communication: Language, reading, dyslexia • Pursuing goals: Thinking, problem solving and acting **Part 2: (Neuro)Cognitive Psychology in the wild II (seminar): winter** In the accompanying seminar we will work through recent examples in the literature for topics of the lecture. The goal is to apply novel knowledge from the lecture to understand and critically discuss actual research approaches.
Reader's advisory	• Esgate, A. (2004) An Introduction to Applied Cognitive Psychology, Psychology Press • Sternberg, RJ and Sternberg, K. (2011) Cognitive Psychology, Wadsworth • Ward (2010) The Student's Guide to Cognitive Neuroscience, Psychology Press
Links	
Language of instruction	English

Duration (semesters)	1 Semester
Module frequency	Part 1 will be offered every summer term, part 2 every winter term.
Module capacity	30
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)
Lern-/Lehrform / Type of program	Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	last class in summer term	The module will be evaluated with a written exam of 2 hours duration. Required active participation for gaining credits: 1-2 presentations participation in discussions on other presentations attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00	SuSe	28 h
Seminar		2.00	WiSe	28 h
Total time of attendance for the module				56 h

psy220 - Human Computer Interaction

Module label	Human Computer Interaction
Module code	psy220
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Jochem Rieger Authorized examiners ◦ Jochem Rieger
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology or other programs related to the field (e.g. neuroscience, computer science, physics etc.).
Skills to be acquired in this module	**Goals of module:** The goal of the module is to provide students with basic skills required to plan, implement and evaluate brain computer interfaces as devices for human computer interaction. BCIs are an ideal showcase as they fully span the interdisciplinary field of HCI design, implementation and evaluation. Moreover, BCI-techniques can be used for modern data-driven basic neuroscience. The module combines a lecture on the theoretical foundations of the most important techniques with a seminar/hands on course in which students learn to implement the BCI-processing steps on real neurophysiological data and further elaborate specific subtopics. **Competencies:** ++ Understanding of the foundations of statistical learning techniques + provide basics to understand technical time series processing and machine learning papers ++ interdisciplinary kowledge & thinking + experimental methods ++ statistics & scientific programming + critical & analytical thinking + scientific communication skills + knowledge transfer + group work + project & time management
Module contents	**Part 1: HCI and BCI Lecture: (Lecture on methodological foundations of BCI): summer** **Part 2: Hands on BCI implementation (practical seminar): summer** Topics covered: • A brief history of BCIs and examples of HCI control and basic neuroscience using BCI • techniques. • Data preprocessing (e.g. filtering, projection techniques) and common artifacts and • artifact treatment) • Feature generation (e.g. fourier transform, spectral estimation techniques, principle • components) • Machine learning for classification and regression (e.g. model parameter optimization in • multivariate regression) • Evaluation (e.g. measures of model quality, cross validation to test model generalization, • permutation tests) Where possible the lecture provides mathematical backgrounds of the data analysis techniques. The practical seminar implements BCI techniques on a real data set and further elaborates specific topics in seminar form.
Reader's advisory	There is no required textbook. The lecture slides and notes should be sufficient. However some resources from which they were developed on are given below: General tutorial text providing and overview and accompanying python code on github: Holdgraf, Christopher R., Jochem W. Rieger, Cristiano Micheli, Stephanie Martin, Robert T. Knight, and Frederic E. Theunissen. 2017. “Encoding and Decoding Models in Cognitive

Electrophysiology." Frontiers in Systems Neuroscience 11. https://doi.org/10.3389/fnsys.2017.00061. (open access)

Signal processing:

Semmlow, J. L. (2008). Biosignal and medical image processing. CRC press. Basis of most of the signal processing section. Has some matlab code.

PCA & SVD

Shlens, Jonathon. 2014. "A Tutorial on Principal Component Analysis." ArXiv:1404.1100 [Cs, Stat], April. http://arxiv.org/abs/1404.1100. Great accessible tutorial on PCA

Unsupervised feature Learning and deep learning tutorial:

http://deeplearning.stanford.edu/tutorial/ Basis of the multivariate machine learning techniques. Has some matlab code.

General texts:

Machine learning and AI:

Hastie, Tibshirani, and Friedman. The elements of statistical learning. Covers a wide range of machine learning topics. Free online.

Russell and Norvig. Artificial Intelligence: A Modern Approach. A comprehensive reference
BCI

Dornhege et al. (2007) Toward Brain Machine Interfacing, The MIT-Press. A collection of essays on BCI related topics.

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

Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	The module will be offered every summer term.
Module capacity	15
Reference text	We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's theses!
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: practical seminar
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: practical seminar
Vorkenntnisse / Previous knowledge	Basic programming skills, some high-school level maths
Vorkenntnisse / Previous knowledge	Basic programming skills, some high-school level maths

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

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00	SuSe	28 h
Seminar		2.00	SuSe	28 h
Total time of attendance for the module				56 h

psy230 - Neuromodulation of Cognition

Module label	Neuromodulation of Cognition
Module code	psy230
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Jochem Rieger Authorized examiners ◦ Jochem Rieger
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.
Skills to be acquired in this module	**Goals of 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 kowledge & thinking ++ experimental methods + ethics / good scientific practice / professional behavior + critical & analytical thinking + scientific communication skills
Module contents	Students will be introduced to the concepts of neuromodulation and the application of theoretical knowledge of neurophysiology to the modulation of cognitive functions. **Part 1: Neuromodulation of cognition (lecture): winter** Neurotransmitter and neuromodulator systems Neuropharmacological intervention Mechanisms of neural plasticity Neurofeedback Electric and magnetic brain stimulation Therapeutical applications **Part 2: Topics in Neuromodulation (seminar): winter** Psychological an therapeutical effects of neuromodulation Modulation of neuronal network function Deep brain stimulation for therapeutical modulation
Reader's advisory	• Kaczmarek, L.K., Levitan, I.B. (1986) Neuromodulation: The Biochemical Control of Neuronal Excitability, Oxford University Press • Demos J.N. (2005) Getting Started with Neurofeedback, Norton Professional Books • Tarsy, D. et al. (2008) Deep Brain Stimulation in Neurological and Psychiatric Disorders, Springer Verlag
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	The module will be offered every winter term.
Module capacity	15

Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	during winter term	Presentation 80% written test on the topics of the lecture 20% Required active participation for gaining credits: participation in discussions on other presentations attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00	WiSe	28 h
Seminar		2.00	WiSe	28 h
Total time of attendance for the module				56 h

psy240 - Computation in Neuroscience

Module label	Computation in Neuroscience
Module code	psy240
Credit points	9.0 KP
Workload	270 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Heiko Stecher Authorized examiners ◦ Heiko Stecher
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will acquire scientific programming skills as well as specific knowledge of computational methods in neuroscience and cognition. They will learn to judge the appropriateness and complexity of computational problems and solutions. **Competencies:** + Neuropsychological / neurophysiological knowledge + experimental methods ++ statistics & scientific programming + critical & analytical thinking + knowledge transfer + group work
Module contents	**Part 1: Introduction to scientific programming I (lecture): winter** Basic data types and structures Flow control (conditions, loops, errors) Testing and debugging Functions **Part 2: Introduction to scientific programming II (lecture): summer** Classes and objects Parallel processing Frequency analysis methods EEG processing **Part 3: Scientific programming I (excercise): winter** Implementation of examples from part 1 **Part 4: Scientific programming II (exercise): summer** Implementation of examples from part 2 **Part 5: Computer-controlled experimentation (seminar): summer** Computer hardware basics Scripting and programming in Presentation Combining stimulus delivery with EEG Temporal precision
Reader's advisory	• Mathworks (2009): MATLAB online documentation • Wallisch P., et al. (2009): MATLAB for Neuroscientists: An Introduction to Scientific Computing in MATLAB. Elsevier/Academic
Links	

Language of instruction	English
Duration (semesters)	2 Semester
Module frequency	The module will start every winter term.
Module capacity	unlimited
Reference text	**Important note:** **Passing the exam of psy240 is mandatory for starting a Practical Project (psy260) and the Master's thesis.**
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Pflicht / Mandatory
Modulart	Pflicht / Mandatory
Lern-/Lehrform / Type of program	Part 1 and 2: lectures; Part 3 and 4: excercises; Part 5: seminar; additional tutorials
Lern-/Lehrform / Type of program	Part 1 and 2: lectures; Part 3 and 4: excercises; Part 5: seminar; additional tutorials
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	exam period at the end of the summer term	The participants will have to independently develop and program a solution for a given neuroscientific problem. Both the written code as well as the documentation of the approach taken will be assessed. Required active participation for gaining credits: script for the presentation of experimental stimuli in part 5 attendance of at least 70% in the seminar 'Presentation', part 5 (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		4.00	SuSe and WiSe	56 h
Seminar		2.00	SuSe	28 h
Exercises		2.00	SuSe and WiSe	28 h
Tutorial		0.00	SuSe or WiSe	0 h
Total time of attendance for the module				112 h

psy251 - Internship

Module label	Internship
Module code	psy251
Credit points	12.0 KP
Workload	360 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Cornelia Kranczioch-Debener Authorized examiners ◦ Cornelia Kranczioch-Debener
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will to obtain provide direct experience in the field of psychology. This includes being involved in the provision of psychological or neuropsychological services in real-life situations, such as neuropsychological testing or counselling in a hospital or mental health clinic, or conducting and contributing to psychological research. The internship should be chosen by the student such that it can provide a meaningful educational opportunity that will help students to decide on their preferred area of work. **Competencies:** ++ expert neuropsychological/neurophysiological knowledge + interdisciplinary knowledge & thinking + experimental methods ++ ethics / good scientific practice / professional behavior ++ knowledge transfer + project & time management
Module contents	The students will work in a field of psychology of personal choice. The student will get to know and participate in the daily work routines of a psychologist.
Reader's advisory	
Links	Information on internships and necessary forms: https://uol.de/en/psychology/master/course-overview/
Languages of instruction	English , German
Duration (semesters)	1 Semester
Module frequency	irregular
Module capacity	unlimited
Reference text	The internship lasts 360 hours (9-10 weeks). It can be performed at 2 different institutions with a minimum duration of 150 hours (4 weeks) for each part. A part of your internship (maximally 150 hours) can be performed internally in the Department of Psychology. Internal internships cannot be performed in the same lab in which you will perform / have performed your Practical Project psy260! Your supervisor must be a psychologist. If your supervisor is NOT a psychologist, please contact us for approval BEFORE you start your internship. Please note that details are regulated in the exam regulations. A blank internship certificate and the report form can be found on the programme website. To generate ideas, a folder with information on internships that other students have performed is available in the office of Dr. Cornelia Kranczioch.
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Pflicht / Mandatory
Modulart	Pflicht / Mandatory
Lern-/Lehrform / Type of program	internship at (external) institution

Lern-/Lehrform / Type of program	internship at (external) institution	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Individual; 2-3 possibilities per semester to present the internship to other students	The students have to hand in a written report (2-3 pages) and give a short presentation about their internship. They have to show a certificate from the institution at which they performed the internship. The internship is evaluated as pass/fail.
Course type	Practical	
SWS	0.00	
Frequency	SuSe or WiSe	
Workload attendance	0 h *(* *360 hours presence at internship institution* *)*	

psy260 - Practical project

Module label	Practical project
Module code	psy260
Credit points	9.0 KP
Workload	270 h (attendance in the lab and accompanying seminars as necessary for your project (~ 200h))
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Jochem Rieger ◦ Christoph Siegfried Herrmann ◦ Stefan Debener ◦ N.N. ◦ Andrea Hildebrandt Authorized examiners ◦ Arkan Al-Zubaidi ◦ Martin Georg Bleichner ◦ Stefan Debener ◦ Carsten Gießing ◦ Andreas Hellmann ◦ Christoph Siegfried Herrmann ◦ Andrea Hildebrandt ◦ Helmut Hildebrandt ◦ Florian Kasten ◦ Cornelia Kranczioch-Debener ◦ Xinyang Liu ◦ Josef Meekes ◦ Bojana Mirkovic ◦ Jalenur Özyurt ◦ Jochem Rieger ◦ Stephanie Rosemann ◦ Heiko Stecher ◦ Daniel Strüber ◦ Christiane Margarete Thiel ◦ Anirudh Unni Module counceling ◦ Riklef Weerda
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology. **You can only start the practical project if you have passed the exam of psy240 (psy241) Computation in Neuroscience!** Priority is given to students with experience in methods used in the respective lab or students who have taken the respective teaching modules.
Skills to be acquired in this module	**Goals of module:** Students will learn to plan, perform and analyse a study in the field of neurocognition. They will need to apply statistical knowledge and programming competencies to the data acquisition and analysis of data. Results will be related to the current neurocognitive literature and presented in a student poster symposium at the end of the module. Additionally, students should gain experience as participants in studies. **Competencies:** ++ experimental methods + statistics & scientific programming ++ data presentation & discussion + independent research + scientific literature + ethics / good scientific practice / professional behavior + scientific communication skills + knowledge transfer + group work ++ project & time management

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

Reader's advisory	
Links	https://uol.de/en/psychology/master/course-overview/
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	The module will be offered every winter term.
Module capacity	unlimited
Reference text	Topics for projects will be presented in a colloquium at the end of the summer term. Students can chose to perform the practical work in either of the research groups of the Department of Psychology. External projects are possible upon approval (information and approval form can be found on the programme website).
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Pflicht / Mandatory
Modulart	Pflicht / Mandatory
Lern-/Lehrform / Type of program	practical work and regular seminar meetings in the group where the project is performed
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: fMRI Data Analysis, psy280: Transcranial Brain Stimulation, or psy220 Human Computer Interaction prior to the practical project. It is expected that students have basic knowledge of Matlab programming before starting the practical project. This is proven by having passed the exam in Computation in Neuroscience.
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: fMRI Data Analysis, psy280: Transcranial Brain Stimulation, or psy220 Human Computer Interaction prior to the practical project. It is expected that students have basic knowledge of Matlab programming before starting the practical project. This is proven by having passed the exam in Computation in Neuroscience.

Examination	Time of examination	Type of examination
Final exam of module	usually end of April	Poster presentation in a student symposium (30% of the grade) and daily project work (70% of the grade).

Course type	Comment	SWS	Frequency	Workload attendance
Seminar	Please select the group in which you perform your practical project.	2.00	WiSe	28 h
Practical	attendance as necessary for your project (~ 200h)	0.00	WiSe	0 h
Total time of attendance for the module				28 h

psy270 - Functional MRI Data Analysis

Module label	Functional MRI Data Analysis
Module code	psy270
Credit points	9.0 KP
Workload	270 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Carsten Gießing Authorized examiners ◦ Carsten Gießing
Entry requirements	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): summer** **Part 2: Planning, performance and analysis of functional neuroimaging studies using MATLAB-based software (seminar): summer** **Part 3: Hands-on fMRI data analysis with SPM (exercise): summer**
Reader's advisory	• Frackowiak RSJ, Friston KJ, Frith C, Dolan R, Price CJ, Zeki S, Ashburner J, and Penny WD (2003). Human Brain Function. Academic Press, 2nd edition. San Diego, USA. • Huettel, SA, Song, AW, & McCarthy, G (2009). Functional Magnetic Resonance Imaging (2nd Edition). Sinauer Associates. Sunderland, MA, USA. • Poldrack RA, Mumford JA, & Nichols TE (2011). Handbook of Functional MRI Data Analysis. Cambridge University Press. New York, USA.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	The module will be offered every summer term.
Module capacity	15 (The remaining places are reserved for Biology and Neuroscience students.)
Reference text	Since the module is primarily offered for the Master's programme Biology it has to be offered as a blocked course. Please contact us if you are interested in the module but have problems with interfering other courses. PLEASE NOTE: We strongly recommend to take either psy170, psy270, 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)
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective

Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar; Part 3: exercise
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar; Part 3: exercise
Vorkenntnisse / Previous knowledge	Students need to have solid statistical knowledge as taught in the Introductory Course Statistics and in Research Methods.
Vorkenntnisse / Previous knowledge	Students need to have solid statistical knowledge as taught in the Introductory Course Statistics and in Research Methods.

Examination	Time of examination	Type of examination
Final exam of module	end of summer term	Oral or written examination Required active participation for gaining credits: 1-2 presentations participation in discussions on other presentations attendance of at least 70% in the seminars and exercises (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00	SuSe	28 h
Exercises		4.00	SuSe	56 h
Seminar		1.00	SuSe	14 h
Total time of attendance for the module				98 h

psy280 - Transcranial Brain Stimulation

Module label	Transcranial Brain Stimulation
Module code	psy280
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Contact person	Module responsibility ◦ Christoph Siegfried Herrmann Authorized examiners ◦ Christoph Siegfried Herrmann ◦ Daniel Strüber
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will gain theoretical and practical knowledge on various non-invasive brain stimulation techniques. **Competencies:** ++ Neuropsychological / neurophysiological knowledge ++ experimental methods + statistics & scientific programming + scientific literature + ethics / good scientific practice / professional behaviour
Module contents	In this module, we will introduce the theoretical concepts, neurophysiological underpinnings and neurocognitive as well as clinical applications of various non-invasive brain stimulation techniques such as transcranial magnetic stimulation (TMS), transcranial direct current stimulation (tDCS), transcranial alternating current stimulation (tACS), and transcranial random noise stimulation (tRNS). A focus will be tACS, because it is especially suited to modulate brain oscillations which have been shown to correlate with cognitive processes. **Part 1: Introduction to transcranial brain stimulation (lecture): summer** • Historical overview of brain stimulation • Different techniques (TMS, tDCS, tACS, tRNS) • Physiological mechanisms (entrainment, after-effects etc.) • The use of transcranial brain stimulation in cognitive neuroscience - Experimental parameters (intensity, electrode montage, etc.) • Pros and cons of TMS vs. tACS • Technical aspects (artefact correction, modelling current flow, etc.) • Safety issues • Ethical considerations of brain stimulation **Part 2: Effects of tACS on physiology and cognition (seminar): summer** • Physiology of tACS (on-line and after-effects) • Modulating cognitive functions (e.g. memory, attention, and perception) • Clinical applications of tACS • Hands-on experience in the lab
Reader's advisory	• Miniussi et al. Transcranial brain stimulation, CRC Press, 2013. • Kadosh. The stimulated brain, Academic Press, 2014.

Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	The module will be offered every summer term.
Module capacity	10
Reference text	We strongly recommend to take either psy170, psy270, psy280, or psy220 to gain methodological competencies (EEG, fMRI, TBS, HCI) that are needed for most practical projects and Master's thesis!
Modullevel	MM (Mastermodul / Master module)
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar
Lern-/Lehrform / Type of program	Part 1: lecture; Part 2: seminar
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	during summer term	Oral presentation in the seminar. Required active participation for gaining credits: attendance of at least 70% in the seminar (use attendance sheet that will be handed out in the beginning of the term).

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00	SuSe	28 h
Seminar		2.00	SuSe	28 h
Total time of attendance for the module				56 h

mam - Master´s Degree Module

Module label	Master´s Degree Module
Module code	mam
Credit points	30.0 KP
Workload	900 h (attendance in the lab meetings: 28h (2 SWS); thesis work: 872 hours)
Used in course of study	• Master's Programme Neurocognitive Psychology (Master) >
Contact person	Authorized examiners ◦ Arkan Al-Zubaidi ◦ Martin Georg Bleichner ◦ Stefan Debener ◦ Carsten Gießing ◦ Andreas Hellmann ◦ Christoph Siegfried Herrmann ◦ Andrea Hildebrandt ◦ Helmut Hildebrandt ◦ Florian Kasten ◦ Cornelia Kranczioch-Debener ◦ Xinyang Liu ◦ Josef Meekes ◦ Bojana Mirkovic ◦ Jalenur Özyurt ◦ Jochem Rieger ◦ Heiko Stecher ◦ Daniel Strüber ◦ Christiane Margarete Thiel ◦ Anirudh Unni
Entry requirements	Enrolment in Master's programme Neurocognitive Psychology. Completion of at least 60 credit points in other modules including module psy240 (psy241) (Computation in Neuroscience). Assignment of a topic by thesis supervisor and official application with the examination office.
Skills to be acquired in this module	**Goals of module:** Students will demonstrate that they are able to perform a psychological experiment according to scientific standards. In addition, they will demonstrate that they are acquainted with the necessary methods and can present their results orally and in written form. **Competencies:** ++ experimental methods + statistics & scientific programming + data presentation & discussion ++ independent research + scientific literature ++ scientific English / writing + ethics / good scientific practice / professional behavior + critical & analytical thinking + scientific communication skills + knowledge transfer ++ project & time management

Module contents	**Part 1: Master's thesis** The students work on a given topic in cognitive neuroscience using literature research and the appropriate experimental methods. **Part 2: Master's colloquium** The preparation of the thesis is accompanied by regular participation in the lab meetings of the groups in which the thesis is performed. Students present their study design at the beginning of their thesis preparation and their results towards the end. In addition, they listen to the presentations of the other lab members and students in the group.
Reader's advisory	
Links	Rules and guidelines for Master's theses are explained here: https://uol.de/en/psychology/master/course-overview/
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	irregular
Module capacity	unlimited
Reference text	If you want to do a Master's thesis outside the Department of Psychology, please follow the rules stated on the program website. We encourage students to use the LaTeX template provided on the course website.
Modullevel	Abschlussmodul (Abschlussmodul / Conclude)
Modullevel	MM (Mastermodul / Master module)
Modulart	Pflicht / Mandatory
Modulart	Pflicht / Mandatory
Lern-/Lehrform / Type of program	individual thesis preparation with supervision
Lern-/Lehrform / Type of program	individual thesis preparation with supervision
Vorkenntnisse / Previous knowledge	contact your supervisor for details
Vorkenntnisse / Previous knowledge	contact your supervisor for details

Examination	Time of examination	Type of examination
Final exam of module	individual appointments	The written thesis will be evaluated by the supervisor and an additional reviewer (90%). The oral presentation and defence of the

Examination	Time of examination	Type of examination
		thesis results will be evaluated (10%).
Course type	Seminar und Projekt	
SWS	2.00	
Frequency	SuSe and WiSe	
Workload attendance	28 h *(* *Attendance as required for your project and 2 hours per week for participating in the lab meetings.* *)*	