Modulhandbuch

Neurocognitive Psychology - Master's Programme

im Wintersemester 2019/2020

erstellt am 28/03/24

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Mastermodule

psy130 - Communication of scientific results

Module label	Communication of scientific results
Modulkürzel	psy130
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Herrmann, Christoph Siegfried (module responsibility) • Herrmann, Christoph Siegfried (Prüfungsberechtigt) • Strüber, Daniel (Prüfungsberechtigt) • Roheger, Mandy (Prüfungsberechtigt) • Mahadevan, Rachana (Prüfungsberechtigt) • Strüber, Daniel (Module counselling)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will acquire specific knowledge about the presentation of scientific results both orally and in writing. Students will learn modern techniques for presentation, literature research and writing skills. They will also be taught about arguing scientifically. **Competencies:** ++ data presentation & discussion ++ scientific literature ++ scientific English / writing ++ scientific communication skills + group work
Module contents	**Part 1: Communication of scientific results (seminar)** Literature search Presentation skills Writing skills **Part 2: Psychological colloquium** Experienced scientists from various psychological disciplines will be giving talks about their experimental results. Speakers will be invited also from other universities. Students are encouraged to discuss the results with the experts and to make suggestions on whom to invite
Literaturempfehlungen	- 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.
Type of module	Pflicht / Mandatory
Module level	MM (Mastermodul / Master module)

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

Examination	Prüfungszeiten	Type of examination
		Required active participation for gaining credits: 70% attendance of the seminar within one semester and at least 8 colloquia within two semesters (will be checked in StudIP) and active discussion in at least 1 colloqium.

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Seminar		2	WiSe	28
Colloquium		2	SoSe und WiSe	28
Präsenzzeit Modul insgesamt				56 h

psy141 - Minor

Module label	Minor
Modulkürzel	psy141
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Rieger, Jochem (Module counselling) • Bleichner, Kerstin (Module counselling) • Rieger, Jochem (Prüfungsberechtigt) • Gießing, Carsten (Prüfungsberechtigt) • Puschmann, Sebastian (Prüfungsberechtigt) • Spiegler, Andreas (Prüfungsberechtigt) • Maier, Esther Christine (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will gain an overview of non-psychological topics related to cognitive neuroscience and neuropsychology. They will see how psychological theories apply in other fields. Students can strengthen their own professional profile. Students may also broaden their psychological knowledge or language skills. **Competencies:**
Module contents	To complement the core of the study programme in a meaningful way, 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, psy290) 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). Students can take the academic writing course ‘English for University Studies: 5. Writing and Reading pb337’ from the language center. Other 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 if they fulfil the following requirements: • Master level (other than language courses) • may be ungraded, but need proof of competence (e.g. a pass/fail exam) Note that Minor courses/modules must not repeat contents of mandatory modules or taken elective modules of the programme. **We recommend taking modules/courses that strengthen your own professional profile.**
Literaturempfehlungen	
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 check thoroughly whether the course/module fulfils the requirements listed under 'module contents' before you start the course/module. The requirements for the minor module are also described in the subject specific amendments to the general examination regulations (fachspez. Anlage). In cases of doubt, the programme coordinator can advise you. Recognition procedure: • Certificates of completion of approved courses/modules (see list of approved courses) have to be sent directly to the examinations office. • Certificates of completion for courses/modules without former approval have to be sent to the head of the examinations committee together with the approval form and a course/module description. 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 and the course credits will be automatically entered for your 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 in a course/module. **Please be aware that you can only use 6 credits for the module psy141 Minor. If you take more Minor courses/modules, these credits cannot be used for your degree. You can still ask the teacher to sign an attendance certificate (download https://uol.de/en/psychology/master/course-overview) or module examination form (https://uol.de/en/course-of-study/exams/neurocognitive-psychology-master-545) which is sufficient for later applications to prove that you took the additional course/module.**
Type of module	Pflicht / Mandatory
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	Lectures and seminars (depends on the chosen modules)

Examination	Prüfungszeiten	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.

Form of instruction	VA-Auswahl
SWS	4
Frequency	SoSe oder WiSe

psy150 - Clinical Psychology

Module label	Clinical Psychology
Modulkürzel	psy150
Credit points	9.0 KP
Workload	270 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Thiel, Christiane Margarete (module responsibility) • Thiel, Christiane Margarete (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of the Module:** Students acquire scientifically sound, critical thinking regarding the genesis and psychopharmacological treatment of various mental illnesses; decision making based on the medical guidelines and evidence-based practice. **Competencies:** ++ Neuropsychological / neurophysiological knowledge + experimental methods + data presentation & discussion + scientific literature + critical & analytical thinking + knowledge transfer + group work
Module contents	The first part of the module provides students with a theoretical and practical background on neurobiological and neurochemical bases of psychiatric disorders and pharmacological interventions. This will be complemented by psychiatric interviews in simulated patients focussing on psychopathological assessment. In the second part, the students will learn to plan and assess the effectiveness of psychological interventions for selected disorders. **Part 1: Neurobiological basis of psychiatric disorders and pharmacological intervention** **(lecture and seminar): winter** Basics of neurotransmitter systems and psychopharmacology Substance Abuse (e.g. psychostimulants, hallucinogenics) Depression Anxiety Disorders Alzheimer's Disease Schizophrenia psychopathological assessment The seminar (voluntary) will be given in German as clinicians and patient actors are involved. **Part 2: Psychological interventions within the framework of evidence-based medicine** **(3 seminars to chose from, one partly in German): summer** The seminars focus on concepts of evidence based treatment: - with application to acquired dysfunctions of the brain (2.1) - to selected psychiatric disorders (2.2) - with application to trauma- and stress-related psychiatric disorders. Special emphasis is placed on children and adolescents (2.3) Options: 1. Students attend both parts 2.1 and 2.2 2. Students attend the first four classes of 2.1 in addition to part 2.3
Literaturempfehlungen	

- Meyer, J.S. & Qenzer, L.F. (2018) 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 that teach clinical contents will be taught in German (partly with accompanying English materials). All mandatory parts are taught in English. German knowledge is not necessary to successfully complete the module.		
Type of module		Pflicht / Mandatory		
Module level		MM (Mastermodul / Master module)		
Teaching/Learning method		Part 1: lecture and seminar: part 2: seminar		
Examination	Prüfungszeiten		Type of examination	
Final exam of module	mid-February		The module will be tested with a written exam (2 h) on the contents of the lecture in part 1. Required active participation for gaining credits: 1 presentation participation in discussions on other presentations attendance of at least 70% in both seminars in part 2 within one semester (will be checked in StudIP).	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Seminar		4	SoSe und WiSe	56
Präsenzzeit Modul insgesamt				84 h

psy170 - Neurophysiology

Module label	Neurophysiology
Modulkürzel	psy170
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Debener, Stefan (module responsibility) • Debener, Stefan (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will understand the basic concepts of biomedical signal processing. They will use EEG analysis tools interactively and independently and will understand the complete chain of EEG analysis steps, from data import to the illustration of results. They will be able to use open source tools for EEG analysis and apply theoretical knowledge to practical problems of physiology. **Competencies:** ++ Neuropsychological / neurophysiological knowledge ++ experimental methods ++ statistics & scientific programming ++ ethics / good scientific practice / professional behavior + group work + project & time management
Module contents	Students will acquire specific knowledge about neurophysiology and neuroanatomy, learn the fundamental concepts of multi-channel EEG analysis, and acquire hands-on skills in recording EEG data and 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** In small groups under supervision of the lecturer, all students will record EEG data of their fellow students and will serve as participants for their classmates. We cannot guarantee same-gender groups. 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 Literatur
Literaturempfehlungen	• 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!
Type of module	Wahlpflicht / Elective
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	Part 1: lecture; Part 2 and 3: seminars

Examination	Prüfungszeiten	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 of fellow students and serving as participant for classmates attendance of at least 70% in each seminar within one semester (will be checked in StudIP).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture	2 semester hours per week in first half of the winter term.	1	WiSe	14
Seminar	2 semester hours per week in second half of the winter term. 2 semester hours per week in summer term.	3	SoSe und WiSe	42
Präsenzzeit Modul insgesamt				56 h

psy181 - Neurocognition

Module label	Neurocognition
Modulkürzel	psy181
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Thiel, Christiane Margarete (module responsibility) • Thiel, Christiane Margarete (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students should be able to recognize and critically evaluate the value of considering neuroscience in the study of psychological topics. **Competencies:** ++ neuropsychological / neurophysiological knowledge ++ interdisciplinary 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). Knowledge will be transferred to 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
Literaturempfehlungen	• Ward (2019) 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	Part 1 will be offered every winter term, part 2 every summer term.
Module capacity	20 (Part 1 (lecture and seminar) are unrestricted, part 2 is restricted to 20 students.)
Type of module	Wahlpflicht / Elective
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	Part 1: lecture and seminar; Part 2: seminar

Examination	Prüfungszeiten	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 both seminars within one semester (will be checked in StudIP).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		1	WiSe	14
Seminar		3	SoSe und WiSe	42
Präsenzzeit Modul insgesamt				56 h

psy190 - Sex and Cognition

Module label	Sex and Cognition
Modulkürzel	psy190
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Strüber, Daniel (module responsibility) • Strüber, Daniel (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.
Skills to be acquired in this module	**Goals of module:** Students will acquire specific knowledge about sex differences in cognitive abilities and social behaviours. They will be able to understand the interrelated impact of social and biological influences on the brain's control of the (sex-specific) behaviours. Students should be able to critically evaluate behavioural sex differences from different perspectives and to reflect on possible implications for society. **Competencies:** ++ neuropsychological / neurophysiological knowledge + interdisciplinary 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
Literaturempfehlungen	• 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	
Type of module		Wahlpflicht / Elective	
Module level		MM (Mastermodul / Master module)	
Teaching/Learning method		Part 1: lecture; Part 2: seminar	
Examination	Prüfungszeiten	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 within one semester (will be checked in StudIP).	

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Seminar		2	WiSe	28
Präsenzzeit Modul insgesamt				56 h

psy201 - Neuropsychology

Module label	Neuropsychology
Modulkürzel	psy201
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Debener, Stefan (module responsibility) • Debener, Stefan (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will learn to understand changes in thinking and behaviour that may arise from brain dysfunctions (part 1, 3), acquire specific knowledge on cognitive rehabilitation (part 2), and learn to understand, communicate and evaluate progress in clinical practice and experimental research in neuropsychology (part 3). **Competencies:** ++ neuropsychological / neurophysiological knowledge + interdisciplinary 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!
Literaturempfehlungen	
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.
Type of module	Wahlpflicht / Elective
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	Part 1: lecture; Part 2: seminar; Part 3: seminar

Examination	Prüfungszeiten	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 one seminar within one semester (will be checked in StudIP).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

psy210 - Applied Cognitive Psychology

Module label	Applied Cognitive Psychology
Modulkürzel	psy210
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Rieger, Jochem (module responsibility) • Rieger, Jochem (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.
Skills to be acquired in this module	**Goals of the module:** Students will gain an overview of theories of (Neuro)Cognitive Psychology with potential for application. On completion of this module students should have a repertoire of cognitive psychology concepts relevant for real world situations, be able to transfer the learned theoretical concepts into practical contexts and evaluate potential issues arising in the process of translation. **Competencies:** ++ Neuropsychological / neurophysiological knowledge + interdisciplinary 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.
Literaturempfehlungen	• 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)		2 Semester	
Module frequency		Part 1 will be offered every summer term, part 2 every winter term.	
Module capacity		30	
Type of module		Wahlpflicht / Elective	
Module level		MM (Mastermodul / Master module)	
Teaching/Learning method		Part 1: 1 lecture (2 SWS); Part 2: 1 seminar (2 SWS)	
Examination		Prüfungszeiten	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 within one semester (will be checked in StudIP).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe	28
Seminar		2	SoSe	28
Präsenzzeit Modul insgesamt				56 h

psy220 - Human Computer Interaction

Module label	Human Computer Interaction
Modulkürzel	psy220
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Rieger, Jochem (module responsibility) • Rieger, Jochem (Prüfungsberechtigt)
Prerequisites	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. Importantly, classical BCI-methods can be used for modern data-driven basic neuroscience. The module is designed as an "enabler course", meaning that ideally students should be able to understand and start independent studies into the BCI-methods. Therefore, it goes into depth instead of breadth. Good programming skills and some active knowledge of high school maths is strongly advised to maximize the learning outcome. **Competencies:** ++ understanding of the foundations of statistical learning techniques + basics to understand technical time series processing and machine learning papers ++ interdisciplinary knowledge & thinking + experimental methods ++ statistics & scientific programming + critical & analytical thinking + scientific communication skills + knowledge transfer + group work + project & time management
Module contents	The module will introduce classic BCI paradigms and brain recoding techniques. However the main focus will be on a deeper understanding of the most important signal processing, machine learning, and performance evaluation techniques. The module combines a lecture on the theoretical foundations a seminar/hands on course in which students learn to implement the BCI-processing steps on real neurophysiological data and further elaborate specific subtopics. **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.

Literaturempfehlungen	

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!
Type of module	Wahlpflicht / Elective
Module level	MM (Mastermodul / Master module)

Teaching/Learning method	Part 1: lecture; Part 2: practical seminar	
Previous knowledge	Basic programming skills, some high-school level maths	
Examination	Prüfungszeiten	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 within one semester (will be checked in StudIP).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe	28
Seminar		2	SoSe	28
Präsenzzeit Modul insgesamt				56 h

psy240 - Computation in Neuroscience

Module label	Computation in Neuroscience
Modulkürzel	psy240
Credit points	9.0 KP
Workload	270 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Stecher, Heiko (module responsibility) • Stecher, Heiko (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will acquire scientific programming skills as well as specific knowledge of computational methods in neuroscience and cognition. They will learn to judge the appropriateness and complexity of computational problems and solutions. **Competencies:** + Neuropsychological / neurophysiological knowledge + experimental methods ++ statistics & scientific programming + critical & analytical thinking + knowledge transfer + group work
Module contents	**Part 1: Introduction to scientific programming I (lecture): winter** Basic data types and structures Flow control (conditions, loops, errors) Testing and debugging Functions **Part 2: Introduction to scientific programming II (lecture): summer** Complex data structures EEG processing Frequency analysis methods Introduction to toolboxes **Part 3: Scientific programming I (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 experiments Combining stimulus delivery with EEG, Eyetracking, etc. Temporal precision
Literaturempfehlungen	• 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.**
Type of module	Pflicht / Mandatory
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	Part 1 and 2: lectures; Part 3 and 4: excercises; Part 5: seminar; additional tutorials

Examination	Prüfungszeiten	Type of examination
Final exam of module	exam period at the end of the summer term	In a 120-minute written exam the participants will have to program MATLAB-scripts for a selection of neuroscientific data-analysis problems, demonstrating their skills in the different topics. The scripts and comments will be written on university-provided laptops and handed in via email or USB-drive. Students need to hand in 1-2 programming tasks in the exercises to be allowed to take part in the exam. Required active participation for gaining credits: script for the presentation of experimental stimuli in part 5 attendance of at least 70% in the seminar 'computer-controlled experimentation', part 5 within one semester (will be checked in StudIP).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture	2h/week in winter and summer term	4	SoSe und WiSe	56
Seminar		2	SoSe	28
Exercises	1h/week in winter and summer term	2	SoSe und WiSe	28
Tutorial	voluntary		SoSe und WiSe	0
Präsenzzeit Modul insgesamt				112 h

psy251 - Internship

Module label	Internship
Modulkürzel	psy251
Credit points	12.0 KP
Workload	360 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Kranczioch-Debener, Cornelia (module responsibility) • Kranczioch-Debener, Cornelia (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will obtain direct experience in the field of psychology. This includes being involved in the provision of psychological or neuropsychological services in real-life situations, such as neuropsychological testing or counselling in a hospital or mental health clinic, or conducting and contributing to psychological research. The internship should be chosen by the student such that it can provide a meaningful educational opportunity that will help students to decide on their preferred area of work. **Competencies:** ++ expert neuropsychological/neurophysiological knowledge + interdisciplinary knowledge & thinking + experimental methods ++ ethics / good scientific practice / professional behavior ++ knowledge transfer + project & time management
Module contents	The students will work in a field of psychology of personal choice. The student will get to know and participate in the daily work routines of a psychologist.
Literaturempfehlungen	
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. Topics for projects will be presented in a colloquium at the end of the summer

term.

Type of module	Pflicht / Mandatory	
Module level	MM (Mastermodul / Master module)	
Teaching/Learning method	internship at (external) institution	
Examination	Prüfungszeiten	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.
Form of instruction	Practical training	
SWS		
Frequency	SoSe oder WiSe	
Workload Präsenzzeit	0 h *(360 hours presence at internship institution)*	

psy260 - Practical project

Module label	Practical project
Modulkürzel	psy260
Credit points	9.0 KP
Workload	270 h (attendance in the lab and accompanying seminars as necessary for your project (~ 200h))
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Debener, Stefan (module responsibility) • Herrmann, Christoph Siegfried (module responsibility) • Hildebrandt, Andrea (module responsibility) • Puschmann, Sebastian (module responsibility) • Rieger, Jochem (module responsibility) • Roheger, Mandy (module responsibility) • Al-Zubaidi, Arkan (Prüfungsberechtigt) • Bleichner, Martin Georg (Prüfungsberechtigt) • Debener, Stefan (Prüfungsberechtigt) • Gießing, Carsten (Prüfungsberechtigt) • Hellmann, Andreas (Prüfungsberechtigt) • Herrmann, Christoph Siegfried (Prüfungsberechtigt) • Hildebrandt, Andrea (Prüfungsberechtigt) • Hildebrandt, Helmut (Prüfungsberechtigt) • Rieger, Jochem (Prüfungsberechtigt) • Kranczioch-Debener, Cornelia (Prüfungsberechtigt) • Özyurt, Jale Nur (Prüfungsberechtigt) • Stecher, Heiko (Prüfungsberechtigt) • Strüber, Daniel (Prüfungsberechtigt) • Thiel, Christiane Margarete (Prüfungsberechtigt) • Rosemann, Stephanie (Prüfungsberechtigt) • Puschmann, Sebastian (Prüfungsberechtigt) • Jäger, Manuela (Prüfungsberechtigt) • Boetzel, Cindy (Prüfungsberechtigt) • Vogeti, Sreekari (Prüfungsberechtigt) • Roheger, Mandy (Prüfungsberechtigt) • Daeglau, Mareike (Prüfungsberechtigt) • Kristanto, Daniel (Prüfungsberechtigt) • Abdolalizadeh Saleh, Amirhussein (Prüfungsberechtigt) • Jacobsen, Nadine (Prüfungsberechtigt) • Short, Cassie Ann (Prüfungsberechtigt) • Marek, Merle (Module counselling)
Further responsible persons	Upon approval by the examination committee other staff members (e.g. PhD students in the laboratories of the Department of Psychology) can act as examiners for psy260.
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. **You can only start the practical project if you have passed the exam of psy240 (psy241)** **Computation in Neuroscience!** Priority is given to students with experience in methods used in the respective lab or students who have taken the respective teaching modules.
Skills to be acquired in this module	**Goals of module:** Students are able to critically review the scientific literature and current state of knowledge concerning a certain topic in the field of cognitive neuroscience or neuropsychology. Based on this, they are able to develop a specific research question and to design an adequate experiment, acquire data and conduct appropriate statistical analyses, building on previously gained competencies in relevant research methods, computer programming and statistical methods. They know how to critically discuss the results of their study in context of the current literature and how to present their findings at a scientific poster

	symposium. **Competencies:** ++ experimental methods + statistics & scientific programming ++ data presentation & discussion + independent research + scientific literature + ethics / good scientific practice / professional behavior + scientific communication skills + knowledge transfer + group work ++ project & time management
Module contents	• The students develop an empirical investigation, carry it out and analyse the results. • The students present and discuss their project in respect to recent literature in regular meetings and in a poster symposium. • Students can develop an experimental design for a follow-up study which could potentially be the topic of their Master's thesis. • As part of the practical project, students should participate in studies of other practical projects!
Literaturempfehlungen	
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).
Type of module	Pflicht / Mandatory
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	practical work and regular seminar meetings in the group where the project is performed
Previous knowledge	PLEASE NOTE: Knowledge of either EEG, fMRI, TBS, or MEG data analysis, or knowledge of HCI or ambulatory assessment methods is essential for most projects offered in the Department of Psychology. We strongly recommend to take either psy170: Neurophysiology, psy270: fMRI Data Analysis, psy280: Transcranial Brain Stimulation, psy220: Human Computer Interaction, or psy290: Ambulatory Assessment 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	Prüfungszeiten	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).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Seminar	Please select the group in which you perform your practical project.	2	WiSe	28

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Practical training	attendance as necessary for your project (~ 200h)		WiSe	0
Präsenzzeit Modul insgesamt				28 h

psy270 - Functional MRI Data Analysis

Module label	Functional MRI Data Analysis
Modulkürzel	psy270
Credit points	9.0 KP
Workload	270 h
Verwendbarkeit des Moduls	• Master's Programme Biology (Master) > Background Modules • Master's Programme Neurocognitive Psychology (Master) > Mastermodule • Master's Programme Neuroscience (Master) > Background Modules
Zuständige Personen	• Gießing, Carsten (module responsibility) • Gießing, Carsten (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology, Neuroscience, or Biology.
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	**Theoretical knowledge on functional MRI data analysis** **Planning, performance and analysis of functional neuroimaging studies using** **MATLAB-based software** **Hands-on fMRI data analysis with SPM**
Literaturempfehlungen	• 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!
Type of module		Wahlpflicht / Elective
Module level		MM (Mastermodul / Master module)
Teaching/Learning method		blocked course with lecture, interactive seminar and exercise parts
Previous knowledge		Students need to have solid statistical knowledge as taught in the Introductory Course Statistics and in Research Methods.
Examination	Prüfungszeiten	Type of examination
Final exam of module	middle 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 within one semester (will be checked in StudIP).
Form of instruction	Seminar	
SWS	1	
Frequency	SoSe	

psy280 - Transcranial Brain Stimulation

Module label	Transcranial Brain Stimulation
Modulkürzel	psy280
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Herrmann, Christoph Siegfried (module responsibility) • Herrmann, Christoph Siegfried (Prüfungsberechtigt) • Strüber, Daniel (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will gain theoretical and practical knowledge on various non-invasive brain stimulation techniques. **Competencies:** ++ Neuropsychological / neurophysiological knowledge ++ experimental methods + statistics & scientific programming + scientific literature + ethics / good scientific practice / professional behaviour
Module contents	In this module, we will introduce the theoretical concepts, neurophysiological underpinnings and neurocognitive as well as clinical applications of various non-invasive brain stimulation techniques such as transcranial magnetic stimulation (TMS), transcranial direct current stimulation (tDCS), transcranial alternating current stimulation (tACS), and transcranial random noise stimulation (tRNS). A focus will be tACS, because it is especially suited to modulate brain oscillations which have been shown to correlate with cognitive processes. **Part 1: Introduction to transcranial brain stimulation (lecture): summer** • Historical overview of brain stimulation • Different techniques (TMS, tDCS, tACS, tRNS) • Physiological mechanisms (entrainment, after-effects etc.) • The use of transcranial brain stimulation in cognitive neuroscience - Experimental parameters (intensity, electrode montage, etc.) • Pros and cons of TMS vs. tACS • Technical aspects (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
Literaturempfehlungen	• 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!
Type of module	Wahlpflicht / Elective
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	Part 1: lecture; Part 2: seminar

Examination	Prüfungszeiten	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 within one semester (will be checked in StudIP).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe	28
Seminar		2	SoSe	28
Präsenzzeit Modul insgesamt				56 h

psy110 - Research methods

Module label	Research methods
Modulkürzel	psy110
Credit points	12.0 KP
Workload	360 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Hildebrandt, Andrea (module responsibility) • Hildebrandt, Andrea (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. Module psy110 is only relevant for students who started their studies before winter term 21/22. (All other students study modules psy111 and psy112.)
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

Literaturempfehlungen	
Links	
Language of instruction	English
Duration (semesters)	2 Semester
Module frequency	The module will start every winter term.
Module capacity	unlimited
Type of module	Pflicht / Mandatory
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	Parts 1 and 3: lectures; Parts 2 and 4: seminars; additional tutorials are offered.
Previous knowledge	basic statistics; otherwise please attend Introductory Course Statistics

Examination	Prüfungszeiten	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).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		4	SoSe und WiSe	56
Seminar	R seminar in summer is voluntary	4	SoSe und WiSe	56
Tutorial	statistics		SoSe und WiSe	0
Präsenzzeit Modul insgesamt				112 h

psy121 - Psychological assessment and diagnostics

Module label	Psychological assessment and diagnostics
Modulkürzel	psy121
Credit points	12.0 KP
Workload	360 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Hildebrandt, Andrea (module responsibility) • Hildebrandt, Andrea (Prüfungsberechtigt) • Hellmann, Andreas (Prüfungsberechtigt) • Roheger, Mandy (Prüfungsberechtigt) • Debener, Stefan (Module counselling)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology.
Skills to be acquired in this module	**Goals of module:** Students will acquire specific knowledge about psychological assessment, test theory and test construction, and will be trained to utilize this knowledge within a research or test development context and in applied settings. With respect to research applications they will learn about traditional and modern test theories and about their usage in the domain of applied psychometrics and the systematic design of interviews and observational methods. From the perspective of applied assessment, students will reflect on the assessment process as a whole. They will learn how to analyze cases (“case conceptualization”), how to plan and conduct the information assessment phase, how to record and summarize collected data and how to integrate across the multitude of information in order to draw conclusions about the case given specific diagnostic strategies (status vs. process assessment and norm oriented vs. criterion oriented assessment, including classificatory decisions). Finally, students will learn about the requirements of test and assessment report generation in written an oral form given a specific applied context. Ethical guidelines and quality norms will be an implicit topic in all courses in the module. **Competencies:** + Neuropsychological / neurophysiological knowledge + interdisciplinary kowledge & thinking + ethics / good scientific practice / professional behavior + critical & analytical thinking
Module contents	**Part 1: Introduction to Psychological Assessment (lecture): winter and summer** • Psychological assessment as a decision process – descriptive and prescriptive models • Introduction to test theories (will be detailed in Part 3) • Assessment methods, their construction and design, quality criteria • The logic of decision making in the assessment process • Classificatory decisions • Psychometrics to single cases • Summarizing results and writing reports **Part 2: Test Theory and Test Construction (lecture): winter and summer** • Classical test theory • Generalizability theory • Latent-State and Trait theory • Latent variable models for different types of item responses • Measurement invariance across groups and time • Network modeling in psychometrics • Preference modeling for constructing faking-resistant questionnaires and tests **Part 3: applied seminars: winter and summer (choose a or b)** **a: The Assessment Process Applied OR** • Case conceptualization (neuropsychology and clinical psychology) • Formulating hypotheses • Selecting assessment procedures and planning administration • Deciding upon decision rules for data integration

• Evaluating the application of assessment procedures
• Analyzing, summarizing and visualizing results
• Integrating results based on the decision rules
• Writing a psychological/assessment report
• Discussing a report with the client

b: Test Construction Applied
• Construct conceptualization
• Deciding upon the response format
• Item mining
• Item analysis
• Test quality report and test manual

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

Literaturempfehlungen	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
Type of module	Pflicht / Mandatory
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	Part 1 and 2: 2 lectures ; Part 3 and 4: seminars
Previous knowledge	You should know basic statistical concepts as they are also covered in the introductory course statistics. Multivariate statistics is a prerequisite for the psychometric track.

Examination	Prüfungszeiten	Type of examination
Final exam of module	Parts of the practical exercise need to be completed and handed in at specific dates during winter and summer term.	The module will be tested by a practical exercise (test application and protocol / test construction). Required active participation for gaining credits: • 1-2 presentations or test executions • handing in parts of the final report during the term • participation in discussions on other presentations • attendance of at least 70% in the seminars (will be checked in StudIP).

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture	In both terms, lectures and seminars will alternate to intermingle theoretical and applied contents.	4	SoSe und WiSe	56
Seminar	In both terms, lectures and seminars will alternate to intermingle theoretical and applied contents.	4	SoSe und WiSe	56
Präsenzzeit Modul insgesamt				112 h

psy230 - Neuromodulation of Cognition

Module label	Neuromodulation of Cognition
Modulkürzel	psy230
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Rieger, Jochem (module responsibility) • Rieger, Jochem (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. Neuroscience students can take part on request.
Skills to be acquired in this module	**Goals of module:** The aim of this module is to provide students with a theoretical background on how cognitive functions can be altered via neuromodulation. **Competencies:** ++ Neuropsychological / neurophysiological knowledge + interdisciplinary 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
Literaturempfehlungen	• 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 no longer be offered!
Module capacity	15
Type of module	Wahlpflicht / Elective

Module level			MM (Mastermodul / Master module)	
Teaching/Learning method			Part 1: lecture; Part 2: seminar	
Examination		Prüfungszeiten	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).	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Seminar		2	WiSe	28
Präsenzzeit Modul insgesamt				56 h

psy241 - Computation in Neuroscience

Module label	Computation in Neuroscience
Modulkürzel	psy241
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Stecher, Heiko (module responsibility) • Stecher, Heiko (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. Module psy241 is only relevant for students who started their studies before winter term 19/20. (All other students study module psy240.)
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:** [nop] + Neuropsychological / neurophysiological knowledge + experimental methods ++ statistics & scientific programming + critical & analytical thinking + knowledge transfer + group work [/nop]
Module contents	**Part 1: Introduction to scientific programming I (theoretical-practical seminar)** - Basic data types and structures - Flow control (conditions, loops, errors) - Testing and debugging - Functions **Part 2: Introduction to scientific programming II (theoretical-practical seminar)** - Classes and objects - Parallel processing - Frequency analysis methods - EEG processing **Part 3: Scientific programming I (excercise)** - Implementation of examples from part 1 **Part 4: Scientific programming II (exercise)** - Implementation of examples from part 2
Literaturempfehlungen	- 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 be offered every winter term.
Module capacity	unlimited

Examination	Prüfungszeiten	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. Bonus for regularly handing in a total of 12 programming exercises.

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Theorie-Praxis-Seminare	2 semester hours per week for winter and summer term	4	SoSe und WiSe	56
Exercises	1 semester hour per week for winter and summer term.	2	SoSe und WiSe	28
Tutorial	2 semester hours per week in winter and summer term		SoSe und WiSe	0
Präsenzzeit Modul insgesamt				84 h

psy250 - Internship

Module label	Internship
Modulkürzel	psy250
Credit points	15.0 KP
Workload	450 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Kranczioch-Debener, Cornelia (module responsibility) • Kranczioch-Debener, Cornelia (Prüfungsberechtigt)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. Module psy250 is only relevant for students who started their studies before winter term 19/20. (All other students study module psy251.)
Skills to be acquired in this module	**Goals of module:** Students will obtain direct experience in the field of psychology. This includes being involved in the provision of psychological or neuropsychological services in real-life situations, such as neuropsychological testing or counselling in a hospital or mental health clinic, or conducting and contributing to psychological research. The internship should be chosen by the student such that it can provide a meaningful educational opportunity that will help students to decide on their preferred area of work. **Competencies:** ++ expert neuropsychological/neurophysiological knowledge + interdisciplinary knowledge & thinking + experimental methods ++ ethics / good scientific practice / professional behavior ++ knowledge transfer + project & time management
Module contents	The student will work in a field of psychology of personal choice. The student will get to know and participate in the daily work routines of a psychologist.
Literaturempfehlungen	
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 450 hours (12 weeks). It can be performed at 2 different institutions with a minimum duration of 150 hours (4 weeks) for each part. Your supervisor must be a psychologist. Please note that details are regulated in the exam regulations. A blank internship certificate and the report form can be found on the programme website. To generate ideas, a folder with information on internships that other students have performed is available in the office of Dr. Cornelia Kranczioch. Please note that, due to the Coronavirus pandemic, you have to hand in a risk assessment form before starting your internship. You can find this form in English or German in the list of supporting documents!
Type of module	Pflicht / Mandatory
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	internship at (external) institution

Examination	Prüfungszeiten	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.

Form of instruction	Practical training
SWS	
Frequency	SoSe und WiSe
Workload Präsenzzeit	0 h (*450 h attendance at internship institution*

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psy120 - Psychological assessment and diagnostics

Module label	Psychological assessment and diagnostics
Modulkürzel	psy120
Credit points	9.0 KP
Workload	270 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Hildebrandt, Andrea (module responsibility) • Hellmann, Andreas (module responsibility) • Hildebrandt, Andrea (Prüfungsberechtigt) • Hellmann, Andreas (Prüfungsberechtigt) • Debener, Stefan (Module counselling)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. Module psy120 is only relevant for students who started their studies before winter term 19/20. (All other students study module psy121.)
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)** - Psychological assessment as a decision process – descriptive and prescriptive models - Theories of reliability (classical and modern approaches) - Theories of validity (classical and modern approaches) - Assessment methods, their construction and design, quality criteria - The logic of decision making in the assessment process - Psychometrics to single cases - Summarizing results and writing reports **Part 2: Psychological Testing (seminar)** - Psychometric bases of tests and questionnaires - Types of tests and questionnaires - Challenges in psychological testing (for example faking good vs. bad) - Examples of published tests and questionnaires - Exercising test applications, scoring and result interpretations **Part 3: Assessment in Clinical Neuropsychology (seminar)** - specific knowledge - exercises in testing / practising tests
Literaturempfehlungen	Will be specified in the courses.
Links	
Language of instruction	English
Duration (semesters)	2 Semester
Module frequency	The module will be offered every winter term.
Module capacity	unlimited
Reference text	If you want to earn the bonus, you need to use the official bonus sheet to prove your attendance which will be handed to you in the beginning of the winter term.

Examination	Prüfungszeiten	Type of examination
Final exam of module	summer term	The module will be tested by a practical exercise (test application and protocol). Bonus for two presentations or test executions (max.) and attendance of at least 70% in the seminars. Group presentations can be counted as one half.

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Seminar		4	SoSe	56

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Präsenzzeit Modul insgesamt				84 h

psy140 - Minor

Module label	Minor
Modulkürzel	psy140
Credit points	9.0 KP
Workload	270 h
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Mastermodule
Zuständige Personen	• Bleichner, Kerstin (Module counselling) • Rieger, Jochem (Module counselling)
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. Module psy140 is only relevant for students who started their studies before winter term 19/20. (All other students study module psy141.)
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 The content of the courses/modules taken as Minor needs to be clearly different from the contents of the Neurocognitive Psychology modules. A list of approved courses/modules can be found on our website. Upon approval, German-speaking students can attend a career-relevant language course (i.e. necessary for internship, practical project or Master's thesis; maximum of 6 CP for this module). Students whose first language is not German, may take German classes. We recommend taking modules/courses that strengthen your own professional profile.
Literaturempfehlungen	
Links	List of approved courses/modules and approval form: https://uol.de/en/psychology/master/course-overview/
Languages of instruction	English , German
Duration (semesters)	1 Semester
Module frequency	irregular
Module capacity	unlimited
Reference text	PLEASE NOTE: • If you want to take a module/course which is not listed in the list of approved courses/modules, please request approval BEFORE you start the course/module (list of approved courses/modules and approval form can be found on our website) • 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.

Examination	Prüfungszeiten	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.

Form of instruction	Course or seminar *(* *Please refer to the module description for information on the courses you can have counted towards psy140 Minor.* *)*
SWS	
Frequency	SoSe und WiSe
Workload Präsenzzeit	0 h *(* *Depends on the chosen course, but at least 14 hours attendance.* *)*

Abschlussmodul

mam - Master´s Degree Module

Module label	Master´s Degree Module
Modulkürzel	mam
Credit points	30.0 KP
Workload	900 h (attendance in the lab meetings: 28h (2 SWS); thesis work: 872 hours)
Verwendbarkeit des Moduls	• Master's Programme Neurocognitive Psychology (Master) > Abschlussmodul
Zuständige Personen	• Al-Zubaidi, Arkan (Prüfungsberechtigt) • Bleichner, Martin Georg (Prüfungsberechtigt) • Debener, Stefan (Prüfungsberechtigt) • Gießing, Carsten (Prüfungsberechtigt) • Rieger, Jochem (Prüfungsberechtigt) • Hellmann, Andreas (Prüfungsberechtigt) • Herrmann, Christoph Siegfried (Prüfungsberechtigt) • Hildebrandt, Andrea (Prüfungsberechtigt) • Boetzel, Cindy (Prüfungsberechtigt) • Hildebrandt, Helmut (Prüfungsberechtigt) • Kranczioch-Debener, Cornelia (Prüfungsberechtigt) • Rosemann, Stephanie (Prüfungsberechtigt) • Özyurt, Jale Nur (Prüfungsberechtigt) • Stecher, Heiko (Prüfungsberechtigt) • Strüber, Daniel (Prüfungsberechtigt) • Thiel, Christiane Margarete (Prüfungsberechtigt) • Puschmann, Sebastian (Prüfungsberechtigt) • Vogeti, Sreekari (Prüfungsberechtigt) • Jäger, Manuela (Prüfungsberechtigt) • Roheger, Mandy (Prüfungsberechtigt) • Daeglau, Mareike (Prüfungsberechtigt) • Kristanto, Daniel (Prüfungsberechtigt) • Jacobsen, Nadine (Prüfungsberechtigt) • Short, Cassie Ann (Prüfungsberechtigt) • Abdolalizadeh Saleh, Amirhussein (Prüfungsberechtigt)
Further responsible persons	thesis supervisors; Upon approval by the examination committee other staff members (e.g. PhD students in the laboratories of the Department of Psychology) can act as examiners for mam.
Prerequisites	Enrolment in Master's programme Neurocognitive Psychology. Completion of at least 60 credit points in other modules including module psy240 (psy241) (Computation in Neuroscience). Assignment of a topic by thesis supervisor and official application with the examination office.
Skills to be acquired in this module	**Goals of module:** Students will demonstrate that they are able to perform a psychological or neuroscientific experiment and/or analyze data originating from such experiments by means of methods according to contemporary scientific standards. Metaanalyses are accepted if they were conducted by means of up to date tools for data extraction and analyses, according to best practices outlined in relevant community guidelines, such as for example Cochrane. In addition, the students 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.
Literaturempfehlungen	
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.
Type of module	Pflicht / Mandatory
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	individual thesis preparation with supervision
Previous knowledge	contact your supervisor for details

Examination	Prüfungszeiten	Type of examination
Final exam of module	individual appointments	The written thesis will be evaluated by the daily supervisor and an additional reviewer (second supervisor) (90%). The oral presentation and defence of the thesis results will be evaluated by both supervisors (10%).

Form of instruction	Seminar und Projekt
SWS	2
Frequency	SoSe und WiSe
Workload Präsenzzeit	28 h *(* *Attendance as required for your project and 2 hours per week for participating in the lab meetings.* *)*