CARL VON OSSIETZKY universität OLDENBURG
FAKULTÄT VI
MEDIZIN UND GESUNDHEITSWISSENSCHAFTEN

Handbook of modules

for the

Master of Science programme

Neurocognitive Psychology

Date: February 15th, 2016

Contents:

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 programme is composed of four parts. The general part contains five mandatory modules comprising 42 CP. The specialized part contains ten modules (with a total of 69 CP) from which students are free to choose at least three with a minimum total of 24 CP. Students should be aware that a total of 24 CP can be achieved by choosing either 4 modules worth 6 CP each or 2 modules worth 9 CP each and 1 module worth 6 CP. The programme lasts two years or four semesters, during which a total of 120 CP must be achieved. This includes 15 CP for an internship lasting 12 weeks and 30 CP for completing the Masters thesis with the accompanying Masters colloquium. Another 9 CP must be acquired via the practical project which can be carried out in one of the Psychology labs at Carl von Ossietzky Universität, another research lab, or in a clinical institution. The programme is designed in a modular fashion. The number of mandatory modules decreases towards the end of the programme, offering increased flexibility to the students.

Overview:

The Masters programme *Neurocognitive Psychology* has the following structure:

General part (mandatory):		**42 CP**
psy110	Research methods	12 CP
psy120	Psychological Assessment and Diagnostics	9 CP
psy130	Communication of scientific results	6 CP
psy140	Minor	9 CP
psy241	Computation in Neuroscience	6 CP
Specialized part (choose 4*6, or 2*9 + 1*6):		**24 CP**
psy150	Clinical Psychology	9 CP
psy160	Psychophysics of visual perception and illusions	6 CP
psy170	Neurophysiology	6 CP
psy181	Neurocognition	6 CP
psy190	Sex and Cognition	6 CP
psy200	Neuropsychology	9 CP
psy210	Applied Cognitive Psychology	6 CP
psy220	Human Computer Interaction	6 CP
psy230	Neuromodulation of Cognition	6 CP
psy270	Functional Neuroimaging	9 CP
Project part (psy250 mandatory; choose 1 practical project):		**24 CP**
psy250	Internship or lab visit	15 CP
psy260	Practical project Applied Cognitive Psychology	9 CP
psy260	Practical project Cognitive Psychology and Psychophysics	9 CP
psy260	Practical project Experimental Psychology	9 CP
psy260	Practical project Experimental Neuropsychology	9 CP
psy260	Practical project Biological Psychology	9 CP
Masters part (mandatory):		**30 CP**
mam	Masters thesis (27 CP) and Masters colloquium (3 CP)	30 CP
Total:		**120 CP**

Degree:
Master of Science in Neurocognitive Psychology

Module psy110: Research Methods

Goals of module:
Students will acquire basic knowledge about the planning of an empirical investigation, setting up computer-controlled experiments, multivariate statistical data analysis, and the interpretation, evaluation and synthesis of empirical results.
Competencies: Ability to analyse, and document, a complex data set in both an explorative manner and guided by hypotheses using appropriate computer programs;
competency to think analytically and to critically reflect diverse methodological approaches.

Contents:
Part 1: Multivariate Statistics I
- Basic concepts of probability, statistical inference, graphical representation of data
- Linear regression (simple and multiple) and analysis of variance
- Logistic regression, multivariate t-test

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

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

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

Teaching methods:
Parts 1 and 4: lecture/lab (2 x 1/1 SWS)
Parts 2 and 3: 2 seminars (2 x 2 SWS)

Requirements for participation:
Enrolment in Masters programme.
The module will be offered every winter term and lasts two semesters.

Effort:
Attendance: 112 h (8 SWS), learning: 248 h., total: 360 h.

Credit points:
- Total number of credit points for the module: 12 (3 CP for each part)

Assessment:
- The module will be tested with an oral exam (20 min).
- A bonus system will be employed.

Person responsible:
Prof. Dr. Hans Colonius

Degree:
Master of Science in Neurocognitive Psychology

Module psy120: Psychological Assessment and Diagnostics

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

Contents:
Part 1: Introduction to Psychological Assessment
- models and approaches
- methods, processes, guidelines
- theory of testing, approaches to test construction

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

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

Literature:
- Coaley, K. (2009) An introduction to psychological assessment and psychometrics. London: Sage.
- Kaplan, R. & Saccuzzo, D. P. (2009) Psychological Testing: Principles, Applications, and Issues. Belmont: Wadsworth.
- Fernández-Ballesteros, R. (ed., 2003) Encyclopedia of psychological assessment. London: SAGE. Vol. 1 & 2.

Teaching methods:
Part 1: 1 lecture (2 SWS)
Part 2: 1 seminar (2 SWS)
Part 3: 1 seminar (2 SWS)

Requirements for participation:
Enrolment in Masters programme.
The module will be offered every winter term and lasts two semesters.

Effort:
Attendance: 84 h. (6 SWS), learning: 186 h., total: 270 h.

Credit points:
- Total number of credit points for the module: 9 (3 CP for each part)

Assessment:
- The module will be tested by a practical exercise (test application and protocol).
- A bonus system will be employed.

Person responsible:
Dr. Andreas Hellmann

Degree:
Master of Science in Neurocognitive Psychology

Module psy130: Communication of Scientific Results

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:
Scientific literacy, team- and group work, presentation techniques, time- and project management.

Contents:
Part 1: Communication of scientific results

- 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.

Literature:

- Sternberg, Robert (2000) Guide to Publishing in Psychology Journals, Cambridge University Press

Teaching methods:
Communication of scientific results: 1 seminar (2 SWS)
Psychological colloquium: 1 colloquium (2 SWS)

Requirements for participation:
Enrolment in Masters programme.
Module Part 1 will be offered every winter term.
Module Part 2 will be offered every semester.

Effort:
Attendance: 56 h. (4 SWS), learning: 124 h., total: 180 h.

Credit points:

- Total number of credit points for the module: 6 (3 CP for each module part)

Assessment:

- The module requires an oral presentation that will be evaluated.
- A bonus system will be employed.

Person responsible:
Prof. Dr. Christoph Herrmann

Degree:
Master of Science in Neurocognitive Psychology

Module psy140: Minor

Goals of module:
Students will gain an overview of non-psychological topics related to cognitive neuroscience. This is intended to enable students to see how psychological theories apply in other fields. German speaking students are free to choose a language course not in their mother tongue (maximum of 6 CP for this module). Possible modules are listed below.
Competencies:
Interdisciplinary thinking

Contents:

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

Teaching methods:
Lectures and seminars (depends on the chosen modules)

Requirements for participation:
Enrolment in Masters programme.

Effort:
Attendance: 14 h. (1 SWS), learning: 226 h., total: 240 h.

Credit points:

- Total number of credit points for the module: 9 CP

Assessment:

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

Person responsible:
Lecturer of the respective module.

Degree:
Master of Science in Neurocognitive Psychology

Module psy150: Clinical Psychology

Goals of the Module:
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, which will be complemented by patient demonstrations. In the second part, the students will learn to plan and assess the effectiveness of psychological interventions for selected disorders.
Competencies: Scientifically sound, critical thinking regarding the genesis and treatment of various mental illnesses; decision making based on the medical guidelines and evidence-based practice.

Contents:
Part 1: Neurobiological basis of psychiatric disorders and pharmacological intervention

- Basics of neurotransmitter systems and psychopharmacology
- Substance Abuse (e.g. psychostimulants, hallucinogenics)
- Depression
- Anxiety Disorders
- Schizophrenia
- Patient demonstrations (in German)

Part 2: (partly in German): Psychological interventions within the framework of evidence-based medicine

- Concepts of evidence based treatment
- Treatment of acquired dysfunctions of the brain
- Treatment of ADHD

Literature:

- 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)

Teaching methods:
1 lecture (part 1, 2 SWS), 2 seminars (part 1, 1 SWS and part 2, 3 SWS)

Requirements for participation:
Enrolment in Masters programme. Prior knowledge of aetiology and assessment of psychological disorders is expected. Since some module parts involve clinical demonstrations and patient contact, basic knowledge of German language is required.
Part 1 will be offered every winter term, part 2 every summer term.

Effort:
Attendance: 84 h. (6 SWS), learning: 186 h., (part 1: 63/117h, part 2: 63/17h), total: 270 h

Credit Points:

- Total number of credit points: 9

Assessment:

- The module will be tested with a written exam (2 h).
- A bonus system will be employed.

Person responsible:
Prof. Dr. ChristianeThiel

Degree:
Master of Science in Neurocognitive Psychology

Module psy160: Psychophysics of visual perception and illusions

Goals of module:
The aim of this module is to provide students with general knowledge on visual perception and psychophysics (part 1). In part 2, an experimental background on how the human brain processes information from the outside world will be provided. To this end, students will not only learn to extract knowledge from scientific articles but also to plan and conduct an experiment on visual perception and to analyse the data.
Competencies:
Scientific literacy, critical and integrative thinking, practice in experimentation, techniques for the presentation of scientific results, analysis of experimental data using MATLAB, communicative competencies.

Contents:
Part 1: Introduction to visual perception and illusions
- Anatomy and physiology of the human visual system
- Theories of vision
- Psychophysics
- Visual illusions

Part 2: Investigating visual illusions
- Defining research questions on a specific illusion
- Planning and conducting an experiment
- Analyzing experimental data

Literature:
- Seckel (2008), Optical Illusions: The Science of Visual Perception, Firefly Books
- Gregory, R.L. (2009) Seeing through illusions. Oxford, University Press.
- Palmer (1999), Vision Science, MIT Press
- Stevens, S.S. (2008) Psychophysics: Introduction to its perceptual, neural, and social prospects, Transaction Publishers

Teaching methods:
Part 1: 1 lecture (2 SWS)
Part 2: 1 seminar (2 SWS)

Requirements for participation:
Enrolment in Masters programme.
Scientific programming skills are required for stimulus presentation and data analysis.
The module will be offered every summer term and lasts one semester.

Effort:
Attendance: 56 h. (4 SWS), learning: 124 h., total: 180 h.

Credit points:
- Total number of credit points for the module: 6 CP (3 CP for each module part)

Assessment:
- The participants will have to plan and conduct an experiment on visual perception and to analyse the data.
- A bonus system will be employed.

Person responsible:
Prof. Dr. Christoph Herrmann

Degree:
Master of Science in Neurocognitive Psychology

Module psy170: Neurophysiology

Goals of module:
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.
Competencies:
Understanding of basic concepts of biomedical signal processing; using EEG analysis tools interactively and independently; understanding the complete chain of EEG analysis steps, from data import to the illustration of results; ability to use open source tools for EEG analysis; application of theoretical knowledge to practical problems of physiology.

Contents:
Part 1: Neurophysiology and neuroanatomy
- Neurophysiology, EEG, EMG, ECG
- Neuroanatomy
- Time-domain and frequency-domain analysis methods

Part 2: EEG recording and analysis
- Recording and analysis of biomedical signals
- Averaging, filtering, signal-to-noise
- Topographical EEG analysis

Part 3: EEG analysis with Matlab
- 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

Literature:
- 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

Teaching methods:
Part 1: 1 lecture (1 SWS)
Part 2: 1 lab (1 SWS)
Part 3: 1 lab (2 SWS)

Requirements for participation:
Enrolment in Masters programme.
The module will be offered every winter term and lasts two semesters.
Participation in ‘Introduction to scientific programming, part 1’ is recommended.

Effort:
Attendance: 56 h. (4 SWS), learning: 124 h., total: 180 h.

Credit points:
- Total number of credit points for the module: 6 CP

Assessment:
- The module will be tested with a written exam of 2 h duration.
- A bonus system will be employed.

Person responsible:
Prof. Dr. Stefan Debener

Degree:
Master of Science in Neurocognitive Psychology

Module psy181: Neurocognition

Goals of module:
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). Students should be able to recognize and critically evaluate the value of considering neuroscience in the study of psychological topics.
Competencies:
Understanding of scientific literature and scientific talks; application of knowledge to different subject areas; interdisciplinary and integrative thinking; mastery of techniques for the presentation of scientific results; ability to discuss current research topics.

Contents:
Part 1: Introduction to cognitive neuroscience
- Brain and cognition, methods of cognitive neuroscience
- Attention, learning and memory
- Emotional and social behaviour
- Language, executive functions

Part 2: Neurocognitive development
- Brain development and cortical plasticity
- Effects of early-life stress on brain development
- Development of object recognition, social cognition, memory, and executive functions

Literature:
- Ward (2010) 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.

Teaching methods:
Part 1: 1 lecture (1 SWS) and one seminar including online lectures (1 SWS)
Part 2: 1 seminar (2 SWS)

Requirements for participation:
Enrolment in Masters programme.
The module will be offered every winter term and lasts one semester.

Effort:
Attendance: 56 h. (4 SWS), learning: 124 h., total: 180 h.

Credit points:
- Total number of credit points for the module: 6 (3 CP for each module part)

Assessment:
- The module will be tested with a written exam of 2 h duration in the term holidays (usually March). A bonus system will be employed.

Person responsible:
Prof. Dr. Christiane Thiel

Degree:
Master of Science in Neurocognitive Psychology

Module psy190: Sex and Cognition

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:
Scientific literacy; critical and integrative thinking; techniques for the presentation of scientific results; communicative competencies.

Contents:
Part 1: Introduction to the study of sex differences
- 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
- 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

Literature:
- 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

Teaching methods:
Part 1: 1 lecture (2 SWS)
Part 2: 1 seminar (2 SWS)

Requirements for participation:
Enrolment in Masters programme.
The module will be offered every summer term and lasts one semester.

Effort:
Attendance: 56 h. (4 SWS), learning: 124 h., total: 180 h.

Credit points:
- Total number of credit points for the module: 6 (3 CP for each module part)

Assessment:
- The module requires an oral presentation that will be evaluated.

Person responsible:
apl. Prof. Dr. Daniel Strüber

Degree:
Master of Science in Neurocognitive Psychology

Module psy200: Neuropsychology

Goals of module:
Students will learn to understand changes in thinking and behaviour that may arise from brain dysfunctions (part 1, 4), acquire specific knowledge on multisensory processes (part 2), and learn to understand, communicate and evaluate progress in clinical practice and experimental research in neuropsychology (part 3, 4).
Competencies:
Ability to acquire neuropsychological knowledge and put this into a broader psychological context; ability to communicate and evaluate neuropsychological information

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

Part 2: Topics in Experimental Neuropsychology
- Neural properties of sensory processing in a multiple sensory systems framework
- Human brain studies of multisensory processes
- Cross-modal plasticity

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

Part 4: Topics in Clinical Neuropsychology (in German)
- Clinical neuroanatomy
- Neurodegenerative diseases
- Dementia

Literature:
- Kolb, B. & Whishaw, I. Q. (2008). Fundamentals of Human Neuropsychology. 6th ed., New York: W. H. Freeman & Co.
- Stein, B.E. (Ed), 2012. The New Handbook of Multisensory Processing. Cambridge, MA: The MIT Press.

Teaching methods:
Part 1: 1 lecture (2 SWS)
Part 2: 1 seminar (2 SWS)
Part 3: 1 colloquium (2 SWS)
Part 4: 1 seminar (2 SWS)

Requirements for participation:
Enrolment in Masters programme.
The module will be offered every winter term and lasts two semesters.

Effort:
Attendance: 84 h. (6 SWS), learning: 186 h., total: 270 h.

Credit points:
- Total number of credit points: 9 (3 CP for each module part, choose 3 of 4)

Exam:
- The module will be tested with a written exam of 2 h duration.
- A bonus system will be employed.

Person responsible:
Prof. Dr. Stefan Debener

Degree:
Master of Science in Neurocognitive Psychology

Module psy210: Applied Cognitive Psychology

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

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

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

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

- In the accompanying seminar we will work through recent examples in the literature for topics of the lecture. The goal is to apply novel knowledge from the lecture to understand and critically discuss actual research approaches.

Literature:

- 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

Teaching methods:
Part 1: 1 lecture (2 SWS), Part 2: 1 seminar (2 SWS). Both parts will run in parallel.

Requirements for participation:
Enrolment in Masters programme.
The module will be offered in summer terms and should be completed within one semester.

Effort:
Attendance: 56 h. (4 SWS), learning: 124 h., total: 180 h.

Credit points:

- Total number of credit points for the module: 6 (3 CP for each module part)

Assessment:

- The module will be evaluated with a written exam of 2 h duration. A bonus system will be employed.

Person responsible:
Prof. Dr. Jochem Rieger

Degree:
Master of Science in Neurocognitive Psychology

Module psy220: Human Computer Interaction

Goals of module:
In this module we will address human computer interaction (HCI) in its interdisciplinary requirements focusing on the perspective from neurocognitive psychology. The goal of the module is to provide students with basic skills required to plan, implement and evaluate devices for human computer interaction. As a specific goal the module works toward the implementation of a brain computer interface (BCI). BCIs are ideal showcases as they fully span the interdisciplinary field of HCI design, implementation and evaluation.
Competencies:
Specific: The students learn core concepts in Human Computer Interaction plus data recording and analysis techniques related to Brain Machine Interfacing.
General: Interdisciplinary thinking, group work, project management.

Contents:
Part 1: Foundations of HCI and BCI

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

Part 2: HCI and BCI in practice.

- The second part of the module builds upon the theoretical concepts elaborated in the first. We will work through recent applications published in the literature and, where applicable, implement parts of a BCI-system and conduct experiments.

Literature:

- Dix et al. (2004) Human Computer Interaction. 3rd edition, Pearson
- Dornhege et al. (2007) Toward Brain Machine Interfacing, The MIT-Press
- Additional literature and material will be provided on the course website.

Teaching methods:
Part 1: 1 lecture (2 SWS)
Part 2: 1 practical course (2 SWS)

Requirements for participation:
Enrolment in Masters program or other programs related to the field (e.g. computer science, physics etc.). Knowledge in statistical data analysis techniques and/or programming (e.g. Module N) is desirable. The module will start every summer term with part 1. Part 2 will be offered in the winter term.

Effort:
Attendance: 56 h. (4 SWS), learning: 124 h., total: 180 h.

Credit points:

- Total number of credit points for the module: 6 (3 CP for each module part)

Assessment:

- The module will be evaluated with an oral exam (20 min).
- A bonus system will be employed.

Person responsible:
Prof. Dr. Jochem Rieger

Degree:
Master of Science in Neurocognitive Psychology

Module psy230: Neuromodulation of Cognition

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:
Understanding of the concepts of neuromodulation; application of theoretical knowledge of neurophysiology to the modulation of cognitive functions.

Contents:
Part 1: Neuromodulation of cognition
- Neurotransmitter systems of cognition
- Neuropharmacological intervention
- Neuroenhancement
- Neurofeedback
- Neurostimulation

Part 2: Neurofeedback
- Neurofeedback in control and therapy
- EEG-Neurofeedback
- EMG-Neurofeedback
- Transcranial magnetic stimulation
- Deep brain stimulation
- Patient safety

Literature:
- 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

Teaching methods:
Part 1: 1 lecture (2 SWS)
Part 2: 1 seminar (2 SWS)

Requirements for participation:
Enrolment in Masters programme.
The module will be offered every winter term and lasts one semester.

Effort:
Attendance: 56 h. (4 SWS), learning: 124 h., total: 180 h.

Credit points:
- Total number of credit points for the module: 6 (3 CP for each module part)

Assessment:
- The module will be evaluated with an oral presentation in the seminar.
- A bonus system will be employed.

Person responsible:
Prof. Dr. Jochem Rieger

Degree:
Master of Science in Psychology and Cognitive Neuroscience

Module psy241: Computation in Neuroscience

Goals of module:
Students will acquire scientific programming skills as well as specific knowledge of computational methods in neuroscience and cognition.
Competencies:
Analytical thinking and structured problem solving; judging the appropriateness and complexity of computational problems and solutions; independent scientific programming.

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

Part 2: Introduction to scientific programming II
- Classes and objects
- Parallel processing
- Frequency analysis methods
- EEG processing

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

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

Literature:
- Mathworks (2009): MATLAB online documentation
- Wallisch P., et al. (2009): MATLAB for Neuroscientists: An Introduction to Scientific Computing in MATLAB. Elsevier/Academic Press

Teaching methods:
Part 1: 1 Seminar (2 SWS)
Part 2: 1 Seminar (2 SWS)
Part 3: 1 Lab (1 SWS)
Part 4: 1 Lab (1 SWS)

Requirements for participation:
Enrolment in Masters programme.
The module will be offered every winter term and lasts two semesters.

Effort:
Attendance: 84 h. (6 SWS), learning: 106 h., total: 180 h.

Credit points:
- Total number of credit points for the module: 6

Assessment:
- 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.

Person responsible:
Dr. Johannes Vosskuhl

Degree:
Master of Science in Neurocognitive Psychology

Module psy270: Functional Neuroimaging

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:
Application of knowledge on research methods and statistics to analysis of functional neuroimaging data.

Contents:
Part 1: Functional MRI data analysis
Part 2: Planning, performance and analysis of functional neuroimaging studies using MATLAB-based software
Part 3: Hands-on fMRI data analysis with SPM

Literature:

- 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.

Teaching methods:
Part 1: 1 lecture (2 SWS)
Part 2: 1 seminar (1 SWS)
Part 3: 1 Practical work (4 SWS)

Requirements for participation:
Enrolment in Masters programme.
The module will be offered every summer term and lasts one semester.
Since the module is primarily offered for the Masters 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.

Effort:
Attendance: 98 h. (7 SWS), learning: 172 h., total: 270 h.

Credit points:

- Total number of credit points for the module: 9 CP

Assessment:

- Oral or written examination

Person responsible:
Dr. Carsten Gießing

Degree: Master of Science in Neurocognitive Psychology
Module psy250: Internship
Goals of module: The goal of the internship is to provide students with the opportunity to participate in the daily work of professional psychologists in their job. Students will be able to make informed, career-specific decisions. Competencies: Career-specific qualifications; application of theoretical knowledge in practice; team work.
Contents: The students will work in a field of psychology and get to know the daily work routines of a psychologist.
Teaching methods: Internship
Requirements for participation: Enrolment in Masters programme.
Effort: Attendance: 450 h. (37,5 h. / week), total: 450 h. The internship lasts 12 weeks. It can be split into two parts, with a minimum duration of 4 weeks for each part. A copy of the *Praktikumsordnung und Vertrag* can be found here: http://www.uni-oldenburg.de/fileadmin/user_upload/psycho/download/master/documents/Praktikumsordnung-Oldenburg.pdf
Credit points: Total number of credit points for the module: 15
Assessment: The students have to give a written report about their internship and show a certificate from the institution at which they performed the internship.
Person responsible: Prof. Dr. Hans Colonius

Degree: Master of Science in Neurocognitive Psychology
Module psy260: Practical project – Applied Cognitive Psychology
Goals of module: Knowledge of literature search, comprehension of scientific texts, acquisition of skills in conducting experimental research. Competencies: Knowledge in planning, performing, and analysis of a neurocognitive study; language skills; arrangement of a scientific report; time management; team- and groupwork; presentation techniques.
Contents: Part 1: Project work • The students develop an empirical investigation, carry it out and analyse the results. Part 2: Project work • The students discuss a recent topic based on literature and develop an experimental design for a study which could potentially be the topic of their Masters thesis.
Teaching methods: Part 1: practical work (2 SWS) Part 2: practical work (2 SWS)
Requirements for participation: Enrolment in Masters programme. Students are recommended to enrol for the respective teaching modules.
Effort: Attendance: 56 h. (4 SWS), learning: 214 h., total: 270 h.
Credit points: • Total number of credit points for the module: 9 CP
Assessment: • Poster presentation about the project work.
Person responsible: N.N.

Degree: Master of Science in Neurocognitive Psychology
Module psy260: Practical project – Cognitive Psychology and Psychophysics
Goals of module: Knowledge of literature search, comprehension of scientific texts, acquisition of skills in conducting experimental research. Competencies: Knowledge in planning, performing, and analysis of a study in cognitive psychology or psychophysics; language skills; arrangement of a scientific report; time management.
Contents: Part 1: Project work • The students develop an empirical investigation, carry it out and analyse the results. Part 2: Project work • The students discuss a recent topic based on literature and develop an experimental design for a study which could potentially be the topic of their Masters thesis.
Teaching methods: Part 1: practical work (2 SWS) Part 2: practical work (2 SWS)
Requirements for participation: Enrolment in Masters programme. Module takes place every term and is partly offered as a blocked course. Students are recommended to enrol for the respective teaching modules.
Effort: Attendance: 56 h. (4 SWS), learning: 214 h., total: 270 h.
Credit points: • Total number of credit points for the module: 9 CP
Assessment: • Poster presentation about the project work.
Person responsible: Prof. Dr. Hans Colonius

Degree: Master of Science in Neurocognitive Psychology
Module psy260: Practical project – Experimental Psychology
Goals of module: Knowledge of literature search, comprehension of scientific texts, acquisition of skills in conducting experimental research. Competencies: Knowledge of planning, performing, and analysis of a neurocognitive study; language skills; arrangement of a scientific report; time management; team- and groupwork; presentation techniques.
Contents: Part 1: Project work • The students develop an empirical investigation, carry it out and analyse the results. Part 2: Project work • The students discuss a recent topic based on literature and develop an experimental design for a study which could potentially be the topic of their Masters thesis.
Teaching methods: Part 1: practical work (2 SWS) Part 2: practical work (2 SWS)
Requirements for participation: Enrolment in Masters programme. Students are recommended to enrol for the respective teaching modules. The module is offered every summer term and lasts 1 semester.
Effort: Attendance: 56 h. (4 SWS), learning: 214 h., total: 270 h.
Credit points: • Total number of credit points for the module: 9 CP
Assessment: • Poster presentation about the project work.
Person responsible: Prof. Dr. Christoph Herrmann

Degree: Master of Science in Neurocognitive Psychology
Module psy260: Practical project – Experimental Neuropsychology
Goals of module: Knowledge of literature search, comprehension of scientific texts, acquisition of skills in conducting experimental research. Competencies: Knowledge of planning, performing, and analysis of a neurocognitive study; language skills; arrangement of a scientific report; time management; team- and groupwork; presentation techniques.
Contents: Part 1: Project work • The students develop an empirical investigation, carry it out and analyse the results. Part 2: Project work • The students discuss a recent topic based on literature and develop an experimental design for a study which could potentially be the topic of their Masters thesis.
Teaching methods: Part 1: practical work (2 SWS) Part 2: practical work (2 SWS)
Requirements for participation: Enrolment in Masters programme Students are recommended to enrol for the respective teaching modules
Effort: Attendance: 56 h. (4 SWS), learning: 214 h., total: 270 h.
Credit points: • Total number of credit points for the module: 9 CP
Assessment: • Poster presentation about the project work.
Person responsible: Prof. Dr. Stefan Debener

Degree:
Master of Science in Neurocognitive Psychology

Module psy260: Practical project – Biological Psychology

Goals of module:
Students will learn to plan, perform and analyse a functional neuroimaging study. They will need to apply statistical knowledge and programming competencies to the data acquisition and analysis of neuroimaging data. Results will be related to the current neurocognitive literature and presented at the end of the module.
Competencies:
Application of knowledge on research methods and functional neuroimaging data analysis; project management and independent project work; presentation of results and design of a research poster; time management.

Contents:
Part 1: Project work
- The students develop an empirical investigation, carry it out and analyse the results.

Part 2: Project work
- The students discuss a recent topic based on literature and develop an experimental design for a study which could potentially be the topic of their Masters thesis.

Teaching methods:
Part 1: practical work (2 SWS)
Part 2: practical work (2 SWS)

Requirements for participation:
Enrolment in Masters programme. Prior enrolment in the module “Functional Neuroimaging” is required. Prior enrolment in the module “Neurocognition” or “Neuropsychology” is recommended.

Effort:
Attendance: 56 h. (4 SWS), learning: 214 h., total: 270 h.

Credit points:
- Total number of credit points for the module: 9 CP

Assessment:
- Poster presentation about the project work.

Person responsible:
Dr. Jale Özyurt

Degree: Master of Science in Neurocognitive Psychology
Module mam: Masters thesis
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: Knowledge in planning, performing, and analysis of a psychological experiment; language skills; arrangement of a scientific report; time management.
Contents: Part 1: Masters thesis • The students work on a given topic in cognitive neuroscience using literature research and the appropriate experimental methods. Part 2: Masters colloquium • The preparation of the thesis is accompanied by a colloquium in which 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 Masters students.
Teaching methods: Supervision of thesis preparation
Requirements for participation: Enrolment in Masters programme Assignment of a topic by thesis supervisor
Effort: Attendance: 28 h. (2 SWS), thesis work: 872 h., total: 900 h.
Credit points: • Total number of credit points for the module: 30
Assessment: • The thesis will be evaluated by the supervisor and an additional reviewer • The oral presentation of the thesis results will be evaluated
Person responsible: The professor heading the lab in which the thesis is written.