Specialisation in Neuropsychology (NP)

The specialisation in Neuropsychology studies the relationship between brain and behaviour. This specialisation focuses on understanding cognitive (memory, perception, planning, attention, psycho-motor functions) and emotional-affective (e.g. mood, anxiety, motivation, arousal) behaviour starting from the perspective of brain structure and function. This is measured on a continuum ranging from normal behaviour to pathological psychiatric dysfunctions (e.g. depression, anxiety, Korsakoff's syndrome, schizophrenia, dementia, ADHD). In addition, in the context of psychopharmacology, the brain-behaviour relationship is thoroughly studied by pharmacological manipulation of brain neurochemistry and function in human and animal models, including the use of interventional psychoactive substances (e.g. hormones, drugs, medicine and foods or dietary ingredients) in combination with behavioural, psychophysiological and neurofunctional research techniques. An integrated programme is presented that includes most aspects of basic and applied neuroscience. In addition, students work in a multidisciplinary team of psychologists, biologists and psychiatrists and have access to state-of-the art clinical, behavioural and bio-psychological laboratories. They further also acquire a basic understanding of neuroimaging techniques.

Coordinator Neuropsychology
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Overview RM in Neuropsychology (NP)

Period	Research Master in Neuropsychology (NP) Year 1 (2016-2017) Track Coordinator: Eric Vuurman
Period 0	Introduction week: **PSY4950** Introduction in Problem-Based Learning (training for non-UM students*) (- credits): Wladimir van Mansum
Throughout Year 1 and 2	**Electives**: **PSY4156** Elective: Course OR **PSY4157** Elective: Review OR **PSY4158** Elective: Research (3 credits each): Vincent van de Ven
Period 1 05-09-2016- 28-10-2016	**Core courses: **** **PSY4407** Brain Damage (4 credits): Martin van Boxtel **PSY4408** Behavioural Disorders (4 credits): Kim Kuypers **PSY4106** Advanced Statistics I (total of 3 credits): Nick Broers *Practical training:* PSY4119 SPSS I and Lisrel: Nick Broers
	Skills training: **PSY4433** Neuropsychological Assessments (2 credits): Sven Stapert
Period 2 31-10-2016 – 23-12-2016	**Core courses:** **PSY4409** Arousal and Attention (4 credits): Lisbeth Evers **PSY4416** Ageing (4 credits): Sonja Kotz **PSY4106** Advanced Statistics I: Nick Broers *Practical training:* PSY4119 SPSS I and Lisrel: Nick Broers
	Skills training: **PSY4434** Basic Cognitive Psychological Skills (3 credits): Eric Vuurman
Christmas break	
Period 3 09-01-2017 – 03-02-2017	**Core course:** **PSY4411** Biopsychology (4 credits): Arjan Blokland
	Skills training: **PSY4108** Neuroanatomy (1 credit): Jos Prickaerts
	PSY4100 Colloquia (total of 1 credit): Milene Bonte, Matthias Wibral, Jos Prickaerts, Eric Vuurman, Anne Roefs, Wim Riedel
Period 4 06-02-2017 – 07-04-2017	**Core course:** **PSY4417** Stress, the Brain and Depression (3 credits): Rob Markus **PSY4413** Executive Control (4 credits): Lisbeth Evers **PSY4107** Advanced Statistics II (total of 3 credits): Gerard van Breukelen *Practical training:* PSY4117 SPSS II: Gerard van Breukelen
	Workshop: **PSY4110** Scientific Writing (1 credit): Jim Schumacher
	PSY4100 Colloquia: Milene Bonte, Matthias Wibral, Jos Prickaerts, Eric Vuurman, Anne Roefs, Wim Riedel

Period 5 10-04-2017 – 09-06-2017	**Core course:** **PSY4414** Neuropsychiatric Disorders (3 credits): Pauline Aalten, Inez Ramakers **PSY4107** Advanced Statistics II: Gerard van Breukelen *Practical training:* PSY4117 SPSS II: Gerard van Breukelen
	Workshop: **PSY4435** Human Neuroimaging (3 credits): Peter Stiers, Heidi Jacobs
	Skills training: **PSY4423** Neuropsychology in Practice: From Test Results to Report and Advice: Caroline van Heugten, Rudolf Ponds **PSY4424** Neuropsychological Rehabilitation (total of 2 credit): Caroline van Heugten
	PSY4100 Colloquia: Milene Bonte, Matthias Wibral, Jos Prickaerts, Eric Vuurman, Anne Roefs, Wim Riedel
Period 6 12-06-2017-07-07-2017	**Core course:** **PSY4415** Neuropsychopharmacology (total of 3 credits): Jan Ramaekers
	Workshop: **PSY4335** Psychopharmacology (1 credit): Peter van Ruitenbeek **PSY4112** Research Grant Writing Workshop (1 credit): Pauline Aalten, Sebastian Köhler **PSY4371** Psychiatric Epidemiology (1 credit): Wolfgang Viechtbauer
	Skills training: **PSY4424** Neuropsychological Rehabilitation: Caroline van Heugten
	PSY4100 Colloquia: Milene Bonte, Matthias Wibral, Jos Prickaerts, Eric Vuurman, Anne Roefs, Wim Riedel

**Students from Erasmus Rotterdam receive an exemption for PBL training*

Period	Research Master in Neuropsychology (NP) Year 2 (2017-2018)
Period 1 05-09-2016-28-10-2016	**Core course:** **PSY5112** Research Grant Writing Course (3 credits): Pauline Aalten, Sebastian Köhler **PSY5411** Cognitive Development (3 credits): Peter Stiers **PSY5414** Brain, Learning and Memory (3 credits): Wim Riedel
	Workshop: **PSY5431** Neuropsychological Assessment in Children (1 credit): Peter Stiers
32 weeks	**PSY5107** Research Proposal**, PSY5120/5121** (research option) **PSY 5122/5123** (clinical option) Research Internship & **PSY5103** Master's Thesis (50 credits) OR **PSY5109** Master's Thesis (30 credits): Sandra Mulkens
	PSY5108 Research Proposal**, PSY5104** Clinical Internship & **PSY5105** Minor's Thesis (20 credits): Sandra Mulkens

PSY4950 will be offered in all RM specialisations. ***See CN***

Colloquia

PSY4100 Colloquia will be offered in all RM specialisations. ***See CN***

Core Courses

Is equal to the Master's module PSY4061

Title	**Brain Damage**
Period	1
Code	PSY4407
ECTS credits	4
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Martin van Boxtel
Descriptions	Our knowledge about cognitive processes and affective functioning comes from close observation of patients with damage to the central nervous system. This course reviews mechanisms of the relationship between brain and specific behaviours that form the basis of neuropsychological dysfunctions in people who suffer from brain damage. Students are introduced to the disciplines of Behavioural Neurology and Neuropsychology via questions such as: What do the effects of pathological conditions on brain structure and/or function learn us about the relationship between brain and behaviour? They acquire knowledge about the causes and neurobiological effects of brain lesions, and become acquainted with the aetiology and taxonomy of common neurological and neuropsychological syndromes. Functional disturbances that occur after focal or diffuse lesions in different cortical areas, in connecting tracts, in limbic and other subcortical brain structures are discussed, together with the neurocognitive assessment procedures that are commonly used to identify such deficits, including disorders of memory, praxis, language, attention, visual spatial abilities and executive function. This knowledge is an essential basis for an understanding of the principles of neuropsychological rehabilitation, which can be used to support or even improve residual function after brain damage and can ameliorate the life quality of neurological patients.
Goals	Knowledge of: Functional brain anatomy, cerebral vascularisation, neurophysiology of brain repair, neurological diseases, stroke, epilepsy, traumatic brain injury, alcohol-induced brain dysfunction, Korsakoff's disease, cognitive control, neuropsychological syndromes, brain plasticity, history of neuropsychology, neuropsychological assessment, cognitive rehabilitation.
Instruction language	EN
Prerequisites	Understanding at Batchelor level of the hierarchical organisation of brain functions, basic brain anatomy and physiology.
Recommended literature	Journal articles; Book chapters.
Teaching methods	Lecture(s) PBL
Assessment methods	Attendance Written exam
Key words	neuropsychology, history of neuropsychology, brain disease, brain injury, functional neuroanatomy, neurology, neuropsychological assessment, rehabilitation, brain plasticity

Is equal to the Master's module PSY4062

Title	**Behavioural Disorders**
Period	1
Code	PSY4408
ECTS credits	4
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Kim Kuypers
Descriptions	The course covers the range of cognitive and behavioural problems that accompany the most common neuropsychiatric and neurological disorders (e.g. schizophrenia, ADHD, autism and acquired brain injuries). The course provides insight into the underlying neurobiological and psychological mechanisms, and it touches on the principle of vulnerability, and protective/risk factors in the aetiology of behavioural disorders.
Goals	Knowledge of: Neuropsychological assessment and- intervention, psychological mechanism, neurobiology, epidemiology, developmental-, psychiatric- and neurological disorders, neuropsychiatric syndromes.
Instruction language	EN
Prerequisites	
Recommended literature	Research and review articles; Case studies; Book chapters.
Teaching methods	Lecture(s) PBL
Assessment methods	Attendance Written exam
Key words	behavioural disorders, development, neuropsychiatry, acquired brain injury, neuropsychology, intervention

PSY4106 Advanced Statistics I will be offered in all RM specialisations. ***See CN***

The practical training associated with PSY4106 Advanced Statistics I is PSY4119. Practical training: SPSS I and Lisrel will be offered in all RM specialisations. ***See CN***

Is equal to the Master's module PSY4064

Title	**Arousal and Attention**
Period	2
Code	PSY4409
ECTS credits	4
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Lisbeth Evers
Descriptions	This course familiarises students with key concepts and controversies in the study of effects of arousal and alertness on attention and cognitive performance, with an emphasis on the role of neurotransmitters. It is known that human performance fluctuates depending on the state of alertness; when we are sleepy or tired we are less attentive to events going on around us than when we are fully awake and alert. However, people who are extremely stressed or highly aroused can also have problems in effectively focussing or shifting their focus of attention (e.g. ADHD, anxiety disorders). The mechanisms underlying the relation between arousal, attention and performance have been the subject of extensive research in psychology. Therefore this course will review current knowledge on subcortical arousal systems, attention networks and the neurotransmitters involved, in addition to a critical discussion of the classical Arousal Theory. Psychopharmacological studies will be presented that illustrate the role of different neurotransmitters in arousal and attention.
Goals	Knowledge of: Arousal Theory, inverted-U model, Yerkes-Dodson law, Ascending Reticular Activating System, Cognitive Energetic Model, Additive Factors Method, Posner's attentional networks, orienting attention, cueing paradigm, Corbetta's model of attentional control, alerting, sustained attention, vigilance, noradrenergic locus coeruleus activity, clonidine, Signal Detection Theory, executive attention, prefrontal dopaminergic activity, methylphenidate, Borbely's model of sleep regulation, caffeine, neurocognitive theory of insomnia, benzodiazepines, flip-flop mechanism of sleep-wake regulation, antihistamines.
Instruction language	EN
Prerequisites	
Recommended literature	Journal articles; Book chapters.
Teaching methods	Lecture(s) PBL
Assessment methods	Attendance Written exam
Key words	arousal, alertness, attention networks, brainstem arousal systems, sleep-wake regulation

Is equal to the Master's module PSY4067

Title	**Ageing**
Period	2
Code	PSY4416
ECTS credits	4
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Sonja Kotz
Descriptions	This course covers a broad range of topics in the field of Cognitive Ageing. We will initially focus on healthy ageing to better understand processing changes that may arise in abnormal aging such as dementia and neurodegeneration. Important questions covered will include: What is ageing? What neurobiological and cognitive mechanisms determine whether a person ages pathologically, normally, or successfully? Can the ageing process be influenced? To address these questions, students will critically reflect on influential theories, state-of-the-art research, established research methods, and clinical interventions. General themes are physical ageing, neural ageing, cognitive ageing, pathological ageing (mild cognitive impairment, Alzheimer's disease, and other types of dementia), intervention strategies, and methodological issues in ageing research.
Goals	Knowledge of: Physical ageing, evolutionary theories of ageing, neural aging, amyloid cascade hypothesis, temporal lobe dysfunction, frontal lobe dysfunction, subcortical dysfunction, processing-speed theory, white matter decline, decline of cognitive control, inhibitory-deficit hypothesis, sensory ageing, default-mode network dysfunction, parietal lobe dysfunction, mild cognitive impairment, Alzheimer's disease, vascular dementia, successful ageing, reserve theories, compensation and intervention, emotional ageing, fronto-temporal dementia, semantic dementia.
Instruction language	EN
Prerequisites	
Recommended literature	E-reader.
Teaching methods	Lecture(s) PBL
Assessment methods	Attendance Written exam
Key words	physical, neural, cognitive, and emotional ageing, dementia, neurodegeneration

Title	**Biopsychology**
Period	3
Code	PSY4411
ECTS credits	4
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Arjan Blokland
Descriptions	This course provides an in-depth description of biopsychological concepts of brain function. It will cover elements from functional neuroanatomy, neurophysiology and psychopharmacology as they are applied to brain and behaviour research. The students will first review the macro- and microanatomy of the brain, and also neurochemical and neurobiological mechanisms related to neurotransmission. Special attention will be paid to basic cellular processes leading to disturbances in the brain. The students will discuss questions such as: How do the chemicals in our brain influence neurons? How do they potentially affect the brain and leads to Alzheimer's disease? What is the specific role of second messengers in these processes? Additionally, the students will deal with the biological mechanisms of neurogenesis and cell differentiation, and how this may be linked to behaviour especially depression and memory.
Goals	Knowledge of: Electrochemical processes in neurons, second messenger systems, mechanisms of neurogenesis and cell survival, molecular pathways (in Alzheimer's disease), role of neurogenesis in memory and depression.
Instructionlanguage	EN
Prerequisites	
Recommendedliterature	Journal articles; Book chapters; Research reviews.
Teaching methods	Lecture(s) PBL Presentation(s)
Assessment methods	Attendance Final paper Presentation
Keywords	action potentials, second messengers, neurotransmitters, depression, cognition, Alzheimer, neurogenesis

Title	**Executive Control**
Period	4
Code	PSY4413
ECTS credits	4
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Lisbeth Evers
Descriptions	A key element in the current understanding of behavioural organisation is executive control. At present, a redefinition of related concepts and a rapid expansion of our knowledge are taking place, based on insights from cognitive neuroscience. Based on data from imaging studies, the behavioural and computational models of cognitive mechanisms are being restructured. Throughout the course, emphasis will be on mechanisms of control, such as motor control needed for movement, and cognitive control (or executive function) to bias the selection of action and thoughts to achieve our goals. Various experimental approaches are evaluated and discussed in the light of recent literature. Experts in the field of cognitive and motor control research will present their current work, and students will be able to discuss their own papers and topics with them.
Goals	Knowledge of: Motor and cognitive control (executive functions) and brain structures involved in these types of control.
Instruction language	EN
Prerequisites	
Recommended literature	Journal article; Book chapters.
Teaching methods	Lecture(s) PBL Presentation(s)
Assessment methods	Attendance Presentation Written Exam
Key words	motor control, cognitive control, executive functions

Title	**Stress, the Brain and Depression**
Period	4
Code	PSY4417
ECTS credits	3
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Rob Markus
Descriptions	It has become increasingly clear that stress is one of the most important triggers for several cognitive-affective disorders. For instance, a tremendous amount of biological and cognitive-psychological research has been conducted on the onset and course of stress-related affective disorders like depression. Cognitively oriented psychologists have shown that the chance of developing stress-related depression is enhanced as a result of negative and dysfunctional (stress-inducing) thoughts, whereas biologically oriented psychologists and psychiatrists particularly emphasize the importance of biochemical brain dysfunction. Yet, despite intensive research over the past decades, unidirectional biological and cognitive achievements have not yet produced definitive conclusions about critical psychobiological risk factors involved in stress-related affective disorders like depression. In addition, and contrary to a one-dimensional approach, this course will concentrate on mutual interactions between stress and the human brain in explaining and defining enhanced susceptibility for stress-related psychopathology.
Goals	Knowledge of: Brain mechanisms involved in stress; biochemistry of depression; interaction between genes, stress and depression.
Instruction language	EN
Prerequisites	
Recommended literature	Journal articles; Book chapters on EleUM.
Teaching methods	Lecture(s) Paper(s) Presentation(s) PBL
Assessment methods	Attendance Final paper
Key words	stress, brain, depression, psychopharmacology

PSY4107 Advanced Statistics II will be offered in all RM specialisations. ***See CN***

The practical training associated with PSY4107 Advanced Statistics II is PSY4117. Practical training SPSS II will be offered in all RM specialisations. ***See CN***

Title	Neuropsychiatric Disorders
Period	5
Code	PSY4414
ECTS credits	3
Organisational unit	Psychiatry and Neuropsychology (FHML)
Coordinator	Pauline Aalten, Inez Ramakers
Descriptions	This course provides basic and advanced knowledge of neuropsychiatric disorders. Several neuropsychiatric disorders will be extensively discussed from a biopsychosocial perspective. In particular, the focus will be on new knowledge and developments within the neuropsychiatry, related to both research and clinical practice. The course covers main findings, biopsychosocial theories and controversies related to several neuropsychiatric disorders, with an emphasis on brain mechanisms and behavioural and cognitive dysfunction. The course discusses disorders at the interface between neuropsychiatry and cognitive/behavioural neurology. Each tutorial meeting covers another neuropsychiatric disorder, for example Gilles de la Tourette, pediatric delirium, Multiple Sclerosis, and anxiety disorder. Specific attention is given to neuropathology related to functional and structural brain imaging, neurochemistry as well as psychosocial factors. In short, this course deals with all major aspects of a number of specific neuropsychiatric disorders, including: basic and advanced knowledge; biopsychosocial theories; neurobiological mechanisms; cognitive and behavioural implications; treatment and research. Students learn to integrate all the previously mentioned aspects of the disorders in order to increase their general knowledge of neuropsychiatry. The tutorial meetings will be led by renowned clinical experts in the field and will provide an excellent learning experience for students who want to focus on working within neuropsychiatry.
Goals	Knowledge of: Neuropsychiatry, biopsychosocial theories of neuropsychiatric disorders, neurobiologic mechanisms, gene environment interactions, behavioural and cognitive problems, neurotransmitters, neuroimaging, scientific and clinical developments, etiology, treatment, clinical practice, Gilles de la Tourette, Pediatric delirium, Multiple sclerosis, and anxiety.
Instruction language	EN
Prerequisites	
Recommended literature	Recent state-of-the-art publications and literature will be provided by the several experts.
Teaching methods	Assignment(s) Lecture(s) Paper(s) PBL Presentation(s) Work in subgroups
Assessment methods	Attendance Final paper Presentation
Key words	neuropsychiatric disorders, brain mechanisms, biological theories, psychosocial theories, research, treatment

Title	**Neuropsychopharmacology**
Period	6
Code	PSY4415
ECTS credits	3
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Jan Ramaekers
Descriptions	This course addresses the influence of drugs upon normal functioning and on disease states. Neurobiological and neurochemical mechanisms are presented with the aim to deepen insight into the various mechanisms of drug action. The course will review major classes of drugs that are used frequently in the treatment of mental disorders and neurological disease, but also other classes of drugs that have side effects on the central nervous system. Other topics in this course are behavioural toxicology, experimental designs used in treatment studies, drugs of abuse and recreational drugs.
Goals	Knowledge of: Neurobiology of drugs and mental disorders.
Instruction language	EN
Prerequisites	
Recommended literature	Journal articles; Book chapters.
Teaching methods	PBL
Assessment methods	Attendance Final paper Presentation
Key words	drug action, psychopharmacology of CNS disorders, behavioural toxicity

PSY5112 Research Grant Writing Course will be offered in all RM specialisations. ***See CN***

Title	**Cognitive Development**
Period	1
Code	PSY5411
ECTS credits	3
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Peter Stiers
Descriptions	The focus of the course is on childhood and adolescence, and on cognitive rather than emotional development. Behavioral changes and underlying brain changes will be discussed. The aim is to learn more about scientific views on normal cognitive development and the methodological difficulties in demonstrating these views empirically. Although the focus is on normal development, development is often studied in the context of abnormal development. Hence, repeated excursions into disorders of cognitive development will be made. Examples of topics that are discussed during the course are general cognitive ability, executive function, brain maturation, cognitive stimulation and training, and time perception.
Goals	Knowledge of: Theoretical and methodological issues in studies of cognitive development from childhood to adolescence.
Instruction language	EN
Prerequisites	
Recommended literature	
Teaching methods	Paper(s) PBL Group assignments
Assessment methods	Attendance Final paper Presentation
Key words	child neuropsychology, individual differences, cognitive development

Title	**Brain, Learning and Memory**
Period	1
Code	PSY5414
ECTS credits	3
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Wim Riedel
Descriptions	There has been a rapid increase in our understanding of the basic mechanisms underlying the consolidation of new information and its subsequent retrieval. Both data from preclinical research in animal models and in preclinical human models and neuroimaging experiments will be used in this course, together with seminal experiments in patients. Recent theories and experimental data illustrate how a multidimensional view of learning and memory can help elucidate the relevant mechanisms in terms of neurobiology, neurochemistry and cognition. The influences of drugs on information processing and memory are also discussed in depth.
Goals	Knowledge of: The role of the hippocampus in memory functions, the role of other limbic structures in learning and memory, the role of neurotransmitters as drug targets in learning and memory. The use and critical evaluation of animal models in learning and memory research.
Instruction language	EN
Prerequisites	
Recommended literature	Literature will be made available on ELeUM.
Teaching methods	Assignment(s) Lecture(s) Paper(s) Presentation(s) PBL
Assessment methods	Attendance Final paper
Key words	prefrontal cortex, hippocampus, limbic system, neurotransmitters, working memory, short-term memory, long-term memory, acquisition, consolidation, retrieval, cognition enhancing drugs

Skills training

Is almost equal to the Master's course PSY4063. In the Master's degree it is practical training; in the RM it is skills training.

Title	**Neuropsychological Assessments**
Period	1
Code	PSY4433
ECTS credits	2
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Sven Stapert
Descriptions	Neuropsychological assessment runs parallel to the courses Brain Damage and Behavioural Disorders. The core elements in this skills training are the collection and interpretation of cognitive, emotional and behavioural data in order to support neurological or neuropsychiatric diagnosis. The skills training commences with an introductory lecture covering the principles and interpretation of neuropsychological assessment. During a 7-week period, students are trained in neuropsychological history taking, observing patient behaviour, cognitive testing and interpreting cognitive and behavioural data. Finally, each student writes a comprehensive neuropsychological report based on a simulated clinical case.
Goals	Knowledge of: Students obtain the basic skills of neuropsychological assessment, i.e. observing, interviewing, cognitive testing, combining and interpreting behavioural and cognitive data and neuropsychological report writing.
Instruction language	EN
Prerequisites	Introductory knowledge on psychodiagnostics and related psychometrics.
Recommended literature	Lezak. M.D. , Howieson, M.D., Bigler, E.D., & Tranel, D. (2012). Neuropsychological Assessment. New York: Oxford University Press; R.D. Vanderploeg (2000). Clinician's Guide to Neuropsychological Assessment. New Jersey: Lawrence Erlbaum Associates.
Teaching methods	Assignment(s) Lecture(s) Paper(s) Patient contact Skills Training(s) Work in subgroups
Assessment methods	Attendance Final paper
Key words	neuropsychological assessment, cognitive disorders, brain disease, brain injury, test taking, interviewing, observations, psychometry

Is almost equal to the Master's course PSY4066. In the Master's degree it is practical training; in the RM it is skills training.

Title	**Basic Cognitive Psychological Skills**
Period	2
Code	PSY4434
ECTS credits	3
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Eric Vuurman
Descriptions	This course focuses on the acquisition and training of basic skills required in cognitive performance research. The course is centred around a psychological experiment in which students study the detrimental effects of arousal manipulation (environmental noise) on cognitive processing. Students will learn how to perform a field experiment and will undertake all the various stages that are necessary to acquire and analyse the data and report on the results. Students will be required to recruit a small number of subjects and to administer the test battery according to a pre-defined protocol. The test battery consists of paper and pencil tests that have been presented and discussed in previous courses. After data acquisition, a number of interactive sessions are planned in which students not only learn to explore and analyse their data with SPSS but also lean how to interpret the results. Students conclude the course by writing a journal style paper in APA format describing the experiment. Particular attention will be given to predicting and explaining the results within a theoretical perspective and comparing them with previous findings. An overview of the techniques and tests currently used to evaluate performance in a number of cognitive domains (such as language, perception, attention and executive functions), are also presented to students in this course.
Goals	Knowledge of: Psychological testing, data preparation, data analysis using multivariate techniques, report writing.
Instruction language	EN
Prerequisites	
Recommended literature	Field, A. (2009). Discovering statistics using SPSS (4^{th} ed.). London: Sage.
Teaching methods	Assignment(s) Lecture(s) PBL
Assessment methods	Attendance Final paper
Key words	field experiment, applied behavioural testing, data reduction and analysis techniques, report writing

PSY4108 Neuroanatomy will be offered in CN, NE, NP and PP. ***See CN***

Title	**Neuropsychology in Practice: From Test Results to Report and Advice**
Period	5
Code	PSY4423
ECTS credits	2
Organisational unit	Neuropsychology and Psychopharmacology (FPN), Psychiatry and Neuropsychology (FHML)
Coordinator	Caroline van Heugten, Rudolf Ponds
Descriptions	The aim of this skills training is to learn to integrate several aspects of a neuropsychological examination. This kind of examination can be used both in clinical settings and in clinical research and contains the following aspects: interview, clinical impression, test results, rating scales, questionnaires, etc. Learning to interpret and integrate the different aspects will result in a coherent neuropsychological report and conclusion. Tests and theoretical and practical knowledge will be presented in the current skills training to help students achieve the course goals. Note that the major focus of this skills training is not to test a patient or a subject participating in a study, but to interpret the data. The skills training consists of eight meetings. In the first two meetings, an overview will be presented of the skills needed to form a conclusion about the data acquired by testing a patient or research subject. Furthermore, students will practise performing and interpreting tests, rating scales and questionnaires. The use of normative data, the concept of validity and what to do when a subject's performance is lower, or otherwise deviant from what would be expected, will also be addressed. Meetings three to eight will be led by clinical experts. Video segments of different patients with a neuropsychological or psychiatric problem (e.g. patients from the departments of psychiatry, neurology and geriatrics) will form the basis of a group discussion and presentations, in which the emphasis will be on the interpretation of patient material.
Goals	Knowledge of: Clinical neuropsychology, assessment, diagnostic techniques, test results, cognitive dysfunctioning, neuropsychiatric disorders, acquired brain injury, Alzheimers disease, dementia, stroke, emotional consequences, behavioural disorders.
Instruction language	EN
Prerequisites	
Recommended literature	Journal articles; Book chapters.
Teaching methods	Assignment(s) Lecture(s) Paper(s) Presentation(s) Skills
Assessment methods	Attendance Presentation
Key words	clinical neuropsychology, assessment, cognitive dysfunctioning, emotional problems, behavioural problems

Title	**Neuropsychological Rehabilitation**
Period	5, 6
Code	PSY4424
ECTS credits	2
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Caroline van Heugten
Descriptions	The course will address the content of neuropsychological interventions as well as the procedures and designs that can be used for the execution of evidence-based research. Throughout the meetings, the basic premises and 'pitfalls' in this type of research will be elaborated and the possibilities to circumvent these problems by proper choice of approach and design will be discussed. Various research designs will be compared in terms of their strengths and weaknesses (e.g. experimental studies, quasi-experimental designs, intention-to-treat, single case designs, challenge-studies, depletion studies). Various forms of neuropsychological treatments will be discussed and students will receive practical training in rehabilitation principles. Skills will be developed that can be applied in cognitive training and psycho-education. Forms of complex behavioural treatment will also be discussed.
Goals	Knowledge of: Clinical neuropsychology, treatment, rehabilitation, cognitive dysfunctioning, emotional problems, behavioural disorders, acquired brain injury, Alzheimers disease, neuropsychiatric disorders, randomised clinical trials, treatment effects, outcome measurement.
Instruction language	EN
Prerequisites	
Recommended literature	Journal articles; Book chapters.
Teaching methods	Assignment(s) Lecture(s) Presentation(s) Skills
Assessment methods	Attendance Final paper
Key words	rehabilitation, treatment, acquired brain damage, effectiveness

Methodological and technical workshops

Scientific Writing will be offered in all RM specialisations. Offering times vary according to RM specialisation: NP: Period 4 PSY4110. ***See CN***

PSY4435 Human Neuroimaging will replace PSY4372 Functional Brain Imaging and will be offered in NP and PP

Title	**Human Neuroimaging**
Period	5
Code	PSY4435
ECTS credits	3
Organisational unit	Cognitive Neuroscience (CN)
Coordinator	Peter Stiers, Heidi Jacobs
Descriptions	This course aims at introducing basic knowledge and principles of functional brain imaging techniques and discussing its use and novel advances in relevant fields of clinical and cognitive research. The workshop comprises two sequential versions that are tailored to two *a priori* levels of background knowledge of students from the Psychopathology and Neuropsychology tracks Version 1 introduces the basic principles of neuroimaging (introduction to imaging methods, experimental design & analysis, fMRI signal, etc.) and basic applications in clinical research. Version 2 introduces a number of technical and methodological advances (multimodal imaging techniques, connectivity analyses, mental chronometry and other matters), and assumes that participants possess *a priori* knowledge of items discussed in version 1. Assignment to a workshop version is determined on an individual basis; participants must follow at least one version. Participants can opt to follow both versions, but will receive no extra credits. General description: The investigation of human brain anatomy and functions using a range of imaging methods represents one of the most influential development in psychology in the last few years. This workshop reviews essential facts about contemporary major structural and functional brain mapping techniques, but the focus will be on functional Magnetic Resonance Imaging (fMRI). In addition, the workshop discusses strengths and weaknesses of neuroimaging methods as instruments to study the normal and pathological brain.
Goals	Knowledge of: Functional brain imaging techniques and principles, promises and pitfalls of functional brain imaging, data analysis, experimental design for brain imaging research, hands-on data analysis and visualisation of brain activity.
Instruction language	EN
Prerequisites	Basic knowledge of brain anatomy, experimental design and statistics.
Recommended literature	Journal articles.
Teaching methods	Lecture(s) Paper(s) Guided skills session analyzing fMRI data
Assessment methods	Attendance Assignment Final paper
Key words	Magnetic Resonance Imaging (MRI), functional MRI, structural MRI, neuroimaging, data analysis, brain activity

PSY4371 Psychiatric Epidemiology will be offered in FN, NP and PP

Title	**Psychiatric Epidemiology**
Period	6
Code	PSY4371
ECTS credits	1
Organisational unit	Psychiatry and Neuropsychology (FHML)
Coordinator	Wolfgang Viechtbauer
Descriptions	The course provides an introduction to the methodologies and analytical strategies of epidemiology as applied to mental health outcomes. The principles and practice of various study types (cohort, case-control, RCT, ecological) will be taught, with emphasis on interpreting associations and possible causality thereof. Consideration will be given to such issues as confounding, bias, and moderation. Further topics to be covered include the use and interpretation of diagnostic studies, the basic principles of analysing dichotomous and time-to-event outcomes, genetic epidemiology, and the use of systematic reviews and meta-analysis for building cumulative knowledge.
Goals	Knowledge of: Different epidemiological study types, including their purpose, advantages, and disadvantages; calculation and interpretation of effect size and outcome measures for dichotomous and time-to-event outcomes; principles of analysing epidemiological studies; genetic epidemiology; the basic steps of conducting a systematic review and meta-analysis.
Instruction language	EN
Prerequisites	
Recommended literature	Rothman, K. J., Greenland, S., & Lash, T. L. (2012). Modern epidemiology (3rd ed.). Lippincott Williams & Wilkins.
Teaching methods	Assignment(s) Lecture(s) Skills Training(s) Work in subgroups PBL
Assessment methods	Attendance Final paper
Key words	epidemiology, methodology, statistics, experimental studies, observational studies, diagnostic studies, systematic reviews, meta-analysis

PSY4112 Research Grant Writing Workshop will be offered in all RM specialisations. ***See CN***

PSY4335 will be offered in ***NP,*** *PP and DN*

Title	**Psychopharmacology**
Period	6
Code	PSY4335
ECTS credits	1
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Peter van Ruitenbeek
Descriptions	Students will become acquainted with current topics in psychopharmacology, i.e. mechanisms of medicinal drugs and nutritional substances. There will be explicit attention to the different perspectives of Psychopharmacology from the tracks in which participating students are residing, ie. Neuropsychology (NP), Psychopathology (PP) and Drug Development and Neurohealth (DN). Some research topics and perspectives in Psychopharmacology: - Old drugs or New Drugs? - Animal Research or Human Research? - Nutrition or Drug Treatment? - Pills or Psychotherapy? - Bottom-up or Top-down?
Goals	Knowledge of: Examples of psychopharmacological studies; present/prepare a presentation on a topic of psychopharmacology.
Instruction language	EN
Prerequisites	
Recommended literature	
Teaching methods	Lecture(s) Presentation(s)
Assessment methods	Attendance Presentation
Key words	psychopharmacology

Title	**Neuropsychological Assessment in Children**
Period	1
Code	PSY5431
ECTS credits	1
Organisational unit	Neuropsychology and Psychopharmacology (FPN)
Coordinator	Peter Stiers
Descriptions	The aim of this workshop is to acquaint students with neuropsychological testing in children and with the interpretation of clinical data in relation to a conceptual model of brain-behaviour relationships. The constructs and assessment of cognitive functions in children will be discussed, with special attention given to methodological aspects of assessment. A number of cognitive tests for children will be presented during the workshop. Models of cognitive psychology will be considered in the context of developmental disorders, including memory, attention, language, information processing and intelligence. The focus is on test paradigms from the field of child neuropsychology used to probe domain-specific functions, with an emphasis on the need to integrate information from different sources: medical history, neurological disorders, radiology, interview, test results, scientific literature, etc.
Goals	Knowledge of: Multiple disability, mental retardation, specific impairments, assessing differential deficits, congenital brain disorders, developmental amnesia, cerebral visual impairment, attention, clinical report writing.
Instruction language	EN
Prerequisites	
Recommended literature	
Teaching methods	Assignment(s) Lecture(s) Paper(s) PBL Presentation(s) Skills Work in subgroups
Assessment methods	Attendance Final paper
Key words	multiple disability, neuropediatrics, specific impairment, neuropsychological methods, congenital disorders, magnetic resonance imaging

Electives

PSY4156 Elective: Course, PSY4157 Elective: Review and PSY4158 Elective: Research will be offered in all RM specialisations. ***See CN***

Internships

3. *PSY5107 Research Proposal, PSY5120/5121(research option) PSY5122/5123 (clinical option), Research Internship and PSY5103 Master's Thesis -> for [CN, NE, FN, DN ->50 credits] and [NP and PP->30 credits]. Internship coordinators differ per specialisation.*
   - *50 credits apply to: CN, NE, FN, DN and for PP and NP students who choose to do only a research Internship (not including the clinical part)*
   - *NP and PP students doing a clinical internship in addition to the research internship will obtain 30 credits for the Research Proposal + Research Internship + Master's Thesis + 20 credits for Clinical Internship, Clinical Research Proposal and Minor's Thesis.*
4. *Clinical Internship, Clinical Research Proposal and Minor's Thesis PSY5104, PSY5108, and PSY5105. Descriptions are the same for NP and PP. Only the internship coordinators differ per specialisation.* ***See NP***

Research Internship and Master's Thesis. ***See CN***

Title	**Clinical Internship, Clinical Research Proposal and Minor's Thesis**
Period	2-6
Code	PSY5104, PSY5108, and PSY5105
ECTS credits	**20** (15, 1, and 4, respectively)
Organisational unit	Clinical Psychological Science (FPN)
Coordinator	Sandra Mulkens
Descriptions	Students specialising in **Psychopathology** or in **Neuropsychology** may choose to conduct a 13-week clinical internship in an approved setting. The clinical internship can be conducted in conjunction with the research internship or separately. Students are required to submit an additional (clinical) research proposal and scientific report (the minor's thesis) based on client/patient-based investigations performed during the clinical internship. The aims of the clinical internship are twofold. Firstly, the internship is meant to provide experience in conducting research in a clinical setting; a small-scale research project culminates in the minor's thesis. Secondly, the internship provides an introduction to the organisation and practice of mental health care, as well as basic experience in clinical diagnosis and therapeutic interventions. For Psychopathology and Neuropsychology students who choose to undertake a clinical internship, the internship and minor's thesis will be assigned 20 credits, whereas the research internship and master's thesis will be assigned 30 credits. A detailed guide on clinical internships and the minor's thesis can be found on EleUM > FPN Research Master Students > Internships. Although it is not a requirement of the research master's programme, students who wish to meet Dutch requirements for admission to advanced clinical training programmes are advised to extend their clinical internship by at least two weeks. - RM Psychopathology Internship Coordinator: Nicole Geschwind, Clinical Psychological Science (FPN), Phone (043) 38 81487, 40 Universiteitssingel East, Room 2.767, Email: Nicole.geschwind@maastrichtuniversity.nl - RM Neuropsychology Internship Coordinator: Esther Keulers, Neuropsychology and Psychopharmacology (FPN), Phone (043) 38 82932, 40 Universiteitssingel East, Room 2.755, Email: esther.keulers@maastrichtuniversity.nl
Goals	Knowledge of: The work environment of the clinical psychologist. This internship gives students the opportunity to practice clinical skills in a real-life setting and to design and conduct a small-scale clinical research project.
Instruction language	EN
Prerequisites	The clinical internship cannot be started until: • At least 60 credits have been attained during the programme; • The above mentioned 60 credits must include the courses Advanced Statistics I and II, and, for students following the Psychopathology specialisation, all Clinical Skills (I–IV) training must be included and for students following the Neuropsychology specialisation the following skills training courses must have been completed:

	- Neuropsychological Assessments; - Basic Cognitive Psychological Skills; - Psychophysiological Skills; - Neuropsychology in practice. Additional requirements can apply to students who did not obtain a Bachelor's degree in Psychology and/or a bachelor's degree at Maastricht University
Recommended literature	
Teaching methods	Assignment(s) Paper(s) Patient contact Research Skills Training(s) Working visit(s)
Assessment methods	Attendance Final paper Observation Participation
Key words	clinical research, clinical practice, clinical training, psychodiagnostics, patient contact