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Prospectus | 09/10

Faculty of Psychology and Neuroscience

Research Master

Faculty of Psychology and Neuroscience

Prospectus

Research Master in Cognitive and Clinical Neuroscience (MSc)

2009 • 2010

Maastricht University

FACULTY of PSYCHOLOGY and NEUROSCIENCE (FPN) ***(Coordinating Faculty)***
FACULTY OF HEALTH, MEDICINE AND LIFE SCIENCES (FHML)

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Timetable Research Master

programme 2009-2010

	August					September					
week	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	
Mon		3	10	17	24	31	7	14	21	28	
Tue		4	11	18	25	1	8	15	22	29	
Wen		5	12	19	26	2	9	16	23	30	
Thu		6	13	20	27	3	10	17	24		
Fri		7	14	21	28	4	11	18	25		
Sat	1	8	15	22	29	5	12	19	26		
Sun	2	9	16	23	30	6	13	20	27		

	October					November					
week	**40**	**41**	**42**	**43**	**44**	**44**	**45**	**46**	**47**	**48**	**49**
Mon		5	12	19	26		2	9	16	23	30
Tue		6	13	20	27		3	10	17	24	
Wen		7	14	21	28		4	11	18	25	
Thu	1	8	15	22	29		5	12	19	26	
Fri	2	9	16	23	30		6	13	20	27	
Sat	3	10	17	24	31		7	14	21	28	
Sun	4	11	18	25		1	8	15	22	29	

	December					January				
week	**49**	**50**	**51**	**52**	**1**	**1**	**2**	**3**	**4**	**5**
Mon		7	14	21	28		4	11	18	25
Tue	1	8	15	22	29		5	12	19	26
Wen	2	9	16	23	30		6	13	20	27
Thu	3	10	17	24	31		7	14	21	28
Fri	4	11	18	25		1	8	15	22	29
Sat	5	12	19	26		2	9	16	23	30
Sun	6	13	20	27		3	10	17	24	31

	February				March					
week	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	
Mon	1	8	15	22	1	8	15	22	29	
Tue	2	9	16	23	2	9	16	23	30	
Wen	3	10	17	24	3	10	17	24	31	
Thu	4	11	18	25	4	11	18	25		
Fri	5	12	19	26	5	12	19	26		
Sat	6	13	20	27	6	13	20	27		
Sun	7	14	21	28	7	14	21	28		

	April					May					
week	**14**	**15**	**16**	**17**	**18**	**18**	**19**	**20**	**21**	**22**	**23**
Mon		5	12	19	26		3	10	17	24	31
Tue		6	13	20	27		4	11	18	25	
Wen		7	14	21	28		5	12	19	26	
Thu	1	8	15	22	29		6	13	20	27	
Fri	2	9	16	23	30		7	14	21	28	
Sat	3	10	17	24		1	8	15	22	29	
Sun	4	11	18	25		2	9	16	23	30	

	June					July				
week	**23**	**24**	**25**	**26**	**27**	**27**	**28**	**29**	**30**	**31**
Mon		7	14	21	28		5	12	19	26
Tue	1	8	15	22	29		6	13	20	27
Wen	2	9	16	23	30		7	14	21	28
Thu	3	10	17	24		1	8	15	22	29
Fri	4	11	18	25		2	9	16	23	30
Sat	5	12	19	26		3	10	17	24	31
Sun	6	13	20	27		4	11	18	25	

Agenda

18-08 till 21-08 Inkom *(General Introduction week)*
31-08 till 04-09 Introduction week

21-12 till 01-01 Christmas Break, no lessons

15-02 till 19-02 Carnival, no lessons

02-04 Good Friday, no lessons
05-04 Easter Monday, no lessons
30-04 Queen's Birthday, no lessons
05-05 Liberation Day, no lessons
13-05 Ascension, no lessons
14-05 no lessons
24-05 With Monday, no lessons

Table of Contents

Introductory Note

Central to our faculty is the training of Bachelor's and Master's students in Biological and Cognitive Psychology. Students will benefit from the comprehensiveness of our curriculum and will have ample opportunities to conduct research with faculty members who work on the cutting edge of their fields.

Our psychology curriculum consists of a three-year Bachelor's programme and two separate Master's programmes. As far as the latter are concerned, the regular Master's programme comprises several one-year tracks, while the Research Master consists of two-year tracks.

Tracks within the regular Master focus on exciting themes that bear strong relevance to practical problems. In the field of Applied Cognitive Psychology, these are: *Health and Social Psychology, Psychology and Law,* and *Work and Organizational Psychology*. In the field of Biological Psychology, there are the following tracks: *Developmental Psychology, Cognitive Neuroscience* and *Neuropsychology*.

The aim of the Research Master is to train students who want to pursue a career as a researcher. Within this Master, four specializations are offered: *Cognitive Neuroscience, Fundamental Neuroscience, Neuropsychology* and *Psychopathology*.

This prospectus gives a detailed description of the various courses that form the building blocks of our Master's programmes. A brief summary of the main issues in each course is given, but also more practical information (e.g., books, course coordinators etc.). In addition, all the important dates are included, such as the beginning and the end of the academic year, holidays, courses, exams, and internships. Furthermore, the prospectus provides an overview of the organization of the faculty and the rules and regulations relating to exams. Finally, this prospectus may serve as a reference book for students and staff.

The faculty wishes all students a productive and academically inspiring year!

Maastricht, July, 2009
Dr. Bernadette Jansma,
Dean of the Faculty of Psychology and Neuroscience

For more information, go to: www.maastrichtuniversity.nl/fpn

Research Master at Maastricht University

Research Master in Cognitive and Clinical Neuroscience

General

The two-year Research Master's (MSc) programme has specializations in Cognitive Neuroscience, Fundamental Neuroscience, Neuropsychology and Psychopathology. This interfaculty programme (Faculty of Psychology and Neuroscience (FPN); Faculty of Health, Medicine and Life Sciences (FHML)) is designed for excellent students who want to continue their studies at a graduate school that prepares them for a career in the field of research.

The programme is internationally oriented and all courses are given in English. Students will become acquainted with the most important theories, models, techniques, and analytic methods in their respective specialization. At the same time, it is deemed of utmost importance to provide students with a stimulating scientific environment that will enable them to develop as independent thinkers with a broad curiosity in the various aspects of the multidisciplinary research domain. The curriculum enables students to gain knowledge of cutting-edge scientific models and theories, while at the same time acquiring experience in a variety of research methods. The programme stimulates scientific insight and a critical attitude through active participation in the form of discussions, presentations, and written papers. Scientific growth is further promoted by intensive contact and collaboration with senior researchers and PhD students from the affiliated research institutes.

The Approach to Instruction: Problem-Based Learning (PBL)

The particular character of what is offered at the Maastricht Faculty of Psychology and Neuroscience is determined by the specific approach to instruction: Problem-Based Learning (PBL). PBL is generally characterized by the following main features:

1. *Student-Centred*

As opposed to other traditional educational approaches, Problem-Based Learning is not centred on the transfer of information from the lecturer to the student, but is rather based on the learning process of the student. Not the lecturer, but the student is central.

2. *Problems Form the Basis for Learning*

Problems form the starting point for the learning process. Students discuss these in depth in small groups. These problems are formulated in such a way that students are led to pose all types of questions pertaining to explanations for these problems. Based on this, students will formulate more pinpointed questions on the subject matter, which they will attempt to find answers to by studying the relevant literature.

3. *Tutorial Groups*

Instruction takes place in tutorial groups of approximately 10 members who meet once or twice weekly. Individual cases are worked with during these meetings based on what has

been taught in the courses. The tutorial groups are led by tutors who guide and monitor the learning process.

4. Self-motivation
The problem-based approach and group discussions stimulate students to acquire relevant knowledge, insight and skills fairly independently and the emphasis is on self-motivation.

Learning Resources

The principles of Problem-Based Learning have numerous consequences for the way learning resources are used. It is, for instance, not absolutely necessary that all students in a tutorial group use the same textbook to familiarize themselves with the basic knowledge on a particular theme or section in the field of psychology. There are various courses for which not one, but a variety of mutually comparable basic textbooks are recommended.
PBL stimulates students to consult a variety of sources in addition to the basic information that can be found in the prescribed textbooks. These other sources can be found in the Learning Resources Centre. From the outset, it is important that students learn to deal with different and sometimes conflicting sources of information and learn to draw conclusions independently about the value of the various insights gained. An essential learning resource, mentioned separately here, is the course manual.

Course Manuals

The subject matter is divided over a number of courses. Each course in problem-based education has a course manual. This is put together by a team of lecturers and students under the guidance of the course coordinator, and comprises all the essential information on the instruction for the course period; i.e. the person responsible for the course, what the course is about, what students need to know by the end of the course, skills taught during the course period, essential and recommended literature, and what lectures are given. The course manual also contains the problems or tasks that are guidelines for studying the subject matter. It is always handed out to students shortly before the course period begins. The data that are gathered from the evaluation of the tuition at the end of the course are in turn used to improve the course manual for the following year.

Internationalization

One of the features of Maastricht University's study profile is internationalization. Scientific developments and the labour market do not stop at Dutch borders and a number of graduates will find employment on the international labour market. In order to prepare students for this, certain courses will be run in English and also opportunities for studying or doing an internship abroad will increase. Furthermore, well-known guest lecturers from elsewhere will be invited to do certain aspects of the programme.

The faculty has started various exchange programmes for students over the past number of years. In future, it will be possible to have an exchange programme for lecturers and possibly also joint research projects as well.
A recent report of exchange programmes can be obtained from the International Office, Phone (043) 38 81920, 40 Universiteitssingel East, Room: see website FPN, e-mail: international-fpn@maastrichtuniversity.nl .

Organization of the Faculty of Psychology and Neuroscience

The following gives an overview of the way in which the Faculty of Psychology and Neuroscience (FPN) is organized. FPN is the coordinator of the RM programme. The most important governing body is the Faculty Board. The Faculty is supported by a staff located at 40 Universiteitssingel, where one will also find the logistical, organizational and administrative support systems for the education programme. The Education Office is the first place to go for the many practical questions and issues. The education programme is located at:

- 40 Universiteitssingel (Uns 40);
- 50 Universiteitssingel (Uns 50);
- 5 Universiteitssingel (Uns 5);
- 1 Debyeplein (Deb 1).

Faculty Board

The Faculty Board, referred to as The Board, is the most important governing body of the Faculty of Psychology and Neuroscience. It consists of four members: the Dean, who is also the Chairperson, the Portfolio Holder for Research, the Portfolio Holder for Innovation and the Portfolio Holder for Education. Two students who have an advisory vote also attend Board meetings. The Board consists of the following persons:

- Chairperson:
  Bernadette Jansma (Dean), Portfolio Holder for General Affairs, Development, Personnel, Finance, Emancipation Affairs, Internal and External Relations, Internationalization, ICT, Accommodation/new buildings, Phone (043) 38 81934, 5 Universiteitssingel, Room 1.013;
- Portfolio Holder for Research:
  Madelon Peters, Phone (043) 38 81603, 40 Universiteitssingel East, Room 5.732a;
- Portfolio Holder for Innovation:
  Rainer Goebel, Phone (043) 38 84014, 40 Universiteitssingel East, Room 4.753;
- Portfolio Holder for Education:
  Arie van der Lugt, Phone (043) 38 82347, 40 Universiteitssingel East, Room 2.732;
- Student Members:
  Jo Stevens (ID 5000467)
  Marjolein de Nooijer (ID 356859);

- Secretary:
  Paul Knibbeler (Director Faculty Office), Phone (043) 38 82174, 5 Universiteitssingel, Room 1.019.

Faculty Council

The Faculty Council is a democratically chosen co-management body that advises the Board and regularly consults with it, with or without having been asked to do so. The Council consists of 10 members, four of whom are chosen from the academic personnel, one from the supporting members of staff and five from the students registered at the FPN. The Faculty Council chooses a chairperson either from its members or from elsewhere.

The Faculty Council comprises the following persons for the 2009-2010 academic year:
Academic Personnel:

- Chairperson: At the beginning of the academic year a new chairman will be appointed;
- Supporting Staff: Ellen Blaauw, Phone (043) 38 84002, 40 Universiteitssingel East, Room: see website FPN;
- Staff-members:
  Michael Capalbo, Phone (043) 38 84037, 40 Universiteitssingel East, Room 4.741;
  Anke Sambeth, Phone (043) 38 81757, 40 Universiteitssingel East, Room 2.741;
  Michelle Moerel, Phone (043) 38 81885, 40 Universiteitssingel East, Room 4.777;
  Gjalt-Jorn Peters, Phone (043) 38 84508, 5 Universiteitssingel, Room 3.015;
- Student Members:
  Emina van Veen (ID 481580);
  Stephanie Klein Tuente (ID 578835);
  Peter Römgens (ID532606);
  Stefan Rose (ID 406589);
  Stijn Gerardu (ID 321397)
- Secretary:
  Paul Knibbeler (Director Faculty Office), Phone (043) 38 82174, 5 Universiteitssingel, Room 1.019

Faculty Departments and Faculty Office

Anyone employed by the Faculty of Psychology and Neuroscience falls under one of the following five groups: the Department of Clinical Psychological Science, The Department of Work and Social Psychology, The Department of Cognitive Neuroscience, The Department of Neuropsychology and Psychopharmacology and the Faculty Office. Most of the people who have been appointed to one of the Departments are scientific staff members: people who conduct research or provide education. Personnel, who provide immediate secretarial support to these members of staff, also belong to one of the Departments. Most support personnel fall under the Faculty Office. This has various sections, each of which has its own field of interest, such as the Education Office, Financial Management, ICT and the research support. In total there are about 150 employees at the FPN.

Commissions Supporting the Educational Programme of the Research Master

Research Master's Coordinator

Alexander Sack, Cognitive Neuroscience, Phone (043) 38 84267, 40
Universiteitssingel East, Room 4.750,
E-mail: a.sack@maastrichtuniversity.nl

Tasks: The Coordinator is responsible for the organization and coordination of the activities connected with the execution of the entire course and examination programme.

Track Coordinators

Cognitive Neuroscience Coordinator: Milene Bonte, Cognitive Neuroscience (FPN),
Phone (043) 38 84036, 40 Universiteitssingel East, Room 4.743,
E-mail: m.bonte@maastrichtuniversity.nl

Fundamental Neuroscience Coordinator: Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML),
Phone (043) 38 81168, 50 Universiteitssingel, Room 1.110,
E-mail: jos.prickaerts@maastrichtuniversity.nl

Neuropsychology Coordinator: Rob Markus, Neuropsychology and Psychopharmacology (FPN), Phone (043) 38 82 474, 40 Universiteitssingel East, Room 2.777a,
E-mail: r.markus@maastrichtuniversity.nl

Psychopathology Coordinator: Nancy Nicolson, Psychiatry and Neuropsychology (FHML),
Phone (043) 36 88684, Vijverdal, Room SN2.068,
E-mail: n.nicolson@sp.unimaas.nl

Research Master's Office

Communication Officer: Els Merken, Phone (043) 38 81747, 40
Universiteitssingel East, Room: see website FPN,
E-mail: els.merken@maastrichtuniversity.nl

Education Committee

The Education Committee advises the Board and the Director of Studies, both in response to questions and on its own initiative, on matters that concern the educational programme. Its aim is to maintain and improve the quality of the educational programme in its entirety. This implies that the Education Committee engages itself with the structure and content of the programme in the light of the aims and the results to be achieved. The Education Committee does not deal with the details of the educational programme.
The members of the Education Committee are the coordinators and a student representative from each of the four specializations.

Board of Examiners

Chairperson: Hanneke van Mier, Phone (043) 38 84010,
40 Universiteitssingel East, Room 4.744.
Tasks: Responsible for the execution of the education and examination regulations.
This Committee also deals with requests for exemptions and related issues.

Admission Board

Chairperson: Hans Stauder, Cognitive Neuroscience, Phone (043) 38 81933,
40 Universiteitssingel East, Room 4.736.
Task: Reviewing the applications for the Research Master's Programme.

Education Office

Head: Irma Kokx, Phone (043) 38 81883, 40 Universiteitssingel East, Room: see website FPN.
The Education Office supports the Director of Studies and carries out further tasks in the field of policy, administration, organization, logistics and planning of the education. More specifically, the Education Office sees to matters such as the division of tutorial groups, processing study results, reservation of halls, maintaining EleUM, the evaluation of the education, etc. It provides information for students on all these matters. It is important that students direct their questions to the appropriate departments or persons. The person in charge is the Head Education Office who sees to the day-to-day coordination of any further curriculum development and aligning the different parts of the programme, both organizationally and content-wise.

Discount on Books

It is possible to purchase study books at a discount through the Faculty Association, 'Luna-tik'. To qualify for this, students have to be a member (costs of membership is Euro 25, - for the full duration of the study).
The telephone number for 'Luna-tik' is (043) 38 81957. It is based at 40 Universiteitssingel East, Room 1.765. The postal address is: Faculty Association Luna-tik, Faculty of Psychology and Neuroscience, P.O. Box 616, 6200 MD Maastricht.

1

The Curriculum

The curriculum includes theoretical courses, colloquia, skill trainings, and workshops followed throughout year 1 and the beginning of year 2. These ensure that students acquire a broad intellectual foundation before choosing a research topic for the remainder of the programme. Core courses form the backbone of the chosen specialization. To increase awareness and appreciation of the value of different research approaches, the course 'Interdisciplinary Perspectives' addresses two broad topics each year, from the perspective of each of the four specializations. Colloquia are designed to integrate topics that are of general interest to the fields of psychology and neuroscience. The colloquia are open to all students, thus fostering interdisciplinary interaction. Skill trainings provide students with the necessary practical knowledge for research in experimental and applied settings, whereas specialized workshops provide the necessary foundation for conducting the Master's thesis research and advanced skills for a future scientific or any other related career.

The Research Master's (MSc) programme is equivalent to 120 European credits.

Core courses

In the core courses students become acquainted with the most important theories, models, techniques, and analytic methods in the domains of Cognitive Neuroscience, Fundamental Neuroscience, Neuropsychology, and Psychopathology. The courses are given in a Problem-Based learning (PBL) or seminar format. Under the guidance of an experienced faculty member, students meet in groups for in-depth discussion of current research issues pertinent to the central theme of the course, based on assigned readings of cutting-edge articles. Course credits (2 to 4 credits per course, depending on its length), and grades are assigned on the basis of assessments that may include written papers, presentations or exams.
Two Advanced Statistics courses (with a total of 5 credits) are shared by all specializations. They consist of a mixture of lectures, hands-on training, and student-centered meetings, designed to acquaint the student with the most important advanced methods with widespread research applications. The final grade is based on a multiple-choice format exam.

Interdisciplinary Perspectives course

This course, required for all students, consists of two series of four lectures each. The lectures on each topic are given by faculty members from the four specializations, with the aim of illustrating different perspectives on a shared research theme. The course will demonstrate the richness of hypotheses, research designs, and methods that can be brought to bear on a given research theme, thus stimulating students to combine these different perspectives in their future research. Required readings, assigned by each lecturer, will be made available prior to the first lecture on a new theme. The final pass-fail assessment is based on the average score obtained on two exams, one following each series of four lectures (3 credits).

Colloquia

The weekly colloquia focus in depth on one of a wide range of topics, with issues transcending the courses and even the specializations. Students will attend colloquia offered by all specialization in order to fostering interdisciplinary knowledge and interaction among students of different specializations and interests. Course credits (5 credits in total) are assigned (pass/fail) at the end of the first year on the basis of attendance, and on the writing of a research proposal and a peer review.

Skill trainings

Skill trainings provide the necessary hands-on experience for research in experimental and applied settings. For Neuropsychology and Psychopathology tracks, training in basic clinical skills is also part of the programme. Each training extends over 4 to 8 weeks, depending on the topic. Some skill trainings will be given to students of multiple specializations. Course credits (1 to 2 credits per training) will be assigned on the basis of attendance and practical exercises.

Workshops

Methodological and technical workshops provide both the necessary basis for conducting the Master's thesis research and advanced skills for a future scientific career. The teaching format varies depending on the topic of the workshop. Many emphasize hands-on experience and practical aspects. Some workshops are mandatory for all specializations, some are shared by two tracks, and some are track-specific. Course credits (1 to 2 credits per workshop) are assigned on the basis of attendance and either exams or practical exercises.

Research internship and Master's thesis

In year 2, from week 9 onwards, students spend most of their time on the preparation and execution of their research project and their Master's thesis. Students from all three specializations conduct their own research project and thereafter report it in the form of a Master's thesis. Course credits will be assigned on the basis of both the research conducted as well as the thesis. The final grade is based on the thesis. For students who do not complete a clinical internship and Minor's thesis (see below), the Master's research and thesis will be assigned 50 credits.

Clinical internship and Minor's thesis

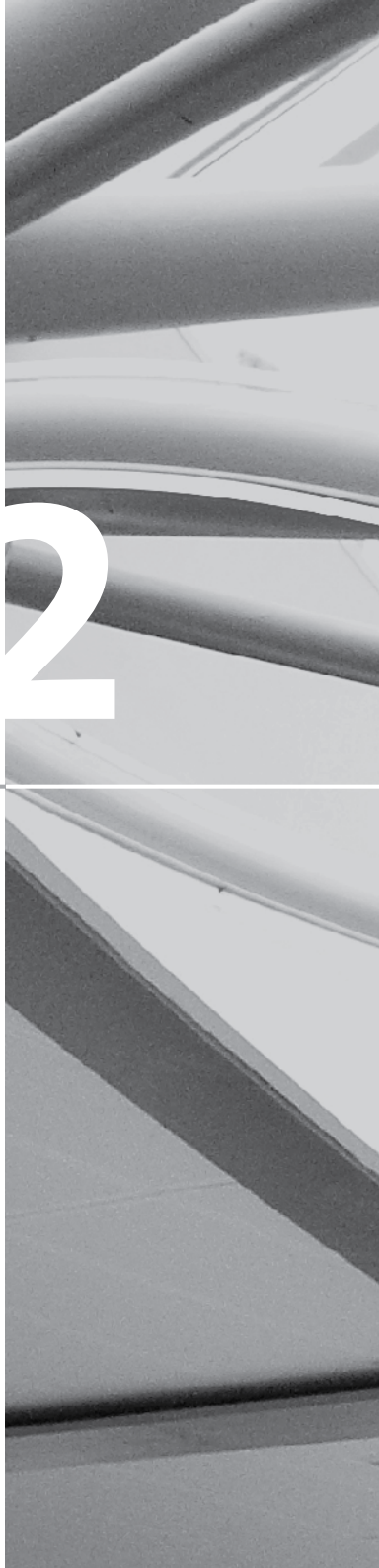
Students specialising in *Psychopathology* are required to conduct a 13-week clinical internship in an approved setting. The clinical internship can be conducted in conjunction

with the research internship or separately. Students are required to submit an additional research proposal and scientific report (the Minor's thesis), based on client/patient-based investigations performed during the clinical internship. Students following the *Neuropsychology* specialization may also choose to do a clinical internship and Minor's thesis. For all students who are either required or choose to do a clinical internship, the Minor's internship and thesis will be assigned 20 credits and the Master's internship and thesis 30 credits.

Mentor

During the first year, students in the Research Master will have regular interactions with a mentor, who helps guide the learning process and supports the student in career planning as well as in finding solutions to possible personal or study problems. Close monitoring of student performance and progression will help ensure that students complete the Master's programme on schedule. During the introductory week of the first year, each student is assigned a faculty mentor, who is a senior researcher in the student's specialization. Students are responsible for scheduling meetings with their mentors. Meetings are to take place at least once a month and are generally short (about 30 minutes or less). The student should inform the mentor in advance about issues to be discussed during the meeting.

In addition to the mentor, faculty student advisors - the so-called 'buddies' - are available for support and guidance.



2

Specialization
Cognitive Neuroscience (CN)

The specialization in Cognitive Neuroscience provides students with an extensive and in-depth theoretical background on all the hot topics of neuroimaging and brain research. Core courses focus on a broad range of topics covering the neural basis of perceptual, cognitive, sensory and motor systems. Specific topics range from basic principles of auditory and visual perception, to higher cognitive functions such as attention, language, mental imagery, self-monitoring, consciousness and neurofeedback. The Cognitive Neuroscience group is known for combining content and methodology to improve answers obtained and questions asked in current and future neuroscientific research. Students are provided with the unique opportunity to be trained in all essential research methods of Cognitive Neuroscience. The Faculty of Psychology and Neuroscience has its own 3-Tesla MRI research scanner and hosts fully equipped EEG as well as TMS laboratories. Students thus gain a thorough understanding of the theoretical background of these most advanced techniques for imaging, recording and manipulating neuronal activation in the human brain. In addition, they acquire hands-on experience in how to operate and use these techniques in the context of empirical neuroscience.

Cognitive Neuroscience Coordinator:

Milene Bonte, Cognitive Neuroscience (FPN), Phone (043) 38 84036,
40 Universiteitssingel East, Room 4.743,
E-mail: m.bonte@maastrichtuniversity.nl

2.1 Interdisciplinary Perspectives

PSY4105 405RM Interdisciplinary Perspectives –3 credits

Coordinators: Nancy Nicolson, Psychiatry and Neuropsychology (FHML), Phone 36 88684, Vijverdal, Room SN2.068, E-mail: n.nicolson@sp.unimaas.nl; Rob Markus, Neuropsychology and Psychopharmacology (FPN), Phone 38 82474, 40 Universiteitssingel East, Room 2.777a, E-mail: r.markus@maastrichtuniversity.nl; Milene Bonte, Cognitive Neuroscience (FPN), Phone 38 84036, 40 Universiteitssingel East, Room 4.743, E-mail: m.bonte@maastrichtuniversity.nl; Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 81168, 50 Universiteitssingel, Room 1.110, E-mail: jos.prickaerts@maastrichtuniversity.nl

Objective(s)
To understand and integrate research approaches from distinct but related disciplines.

Key words
Memory, developmental psychology.

Description of the Course
This lecture course, attended by all first-year students, is designed to highlight selected research topics from the perspectives of cognitive neuroscience, fundamental

neuroscience, neuropsychology and psychopathology. The aim is to illustrate how the distinct but inter-related approaches to questions in the field of brain and behaviour can enrich our understanding of underlying mechanisms as well as cognitive, emotional and behavioural outcomes in health and disorder.

Instructional Approach
A series of four lectures for each of two broad themes. Faculty members from each of the four specializations will present lectures in successive weeks.
Required readings, assigned by each lecturer, will be made available prior to the first meeting of a new theme.

Form of Assessment
Following each series of four lectures, an exam will be given, covering material from all of the assigned readings and lectures for that theme. A final pass/fail score is based on the average grade obtained on the two exams.

2.2 Colloquia

PSY4100 404 RM Colloquia – 5 credits
Coordinators: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 81940, 40 Universiteitssingel East, Room 2.743, E-mail:E.Theunissen@maastrichtuniversity.nl;
Joel Reithler, Cognitive Neuroscience (FPN), Phone 38 81896, 40 Universiteitssingel East, Room 4.761, E-mail: J.Reithler@maastrichtuniversity.nl;
Anne Roefs, Clinical Psychological Science (FPN), Phone 38 82191, 40 Universiteitssingel East, Room 3.747, E-mail: A.Roefs@maastrichtuniversity.nl;
Harry Steinbusch, Psychiatry and Neuropsychology (FHML), Phone 38 81021, 50 Universiteitssingel, Room 1.112, E-mail: h.steinbusch@np.unimaas.nl

Objective(s)
The purpose of the colloquia is to foster interdisciplinary knowledge and interaction among students from different specializations and with varying interests. In addition, the assignments provide students with valuable practice in writing research proposals and in peer reviewing - two extremely important skills for a young scientist.

Key words
Interdisciplinary knowledge, research proposal, peer review.

Description of the Course
Weekly colloquia are presented by UM faculty and by visiting guest lecturers. The colloquia focus in depth on one of a wide range of topics, with issues transcending the courses and even the specializations. Each colloquium will consist of a lecture followed by active discussion, prepared and chaired by the lecturer (for guest lecturers, the UM

host may fill this role). Each specialization will organize 7 or more colloquia so that a total of approximately 24 colloquia will be offered each year.

Literature
Most colloquium speakers will provide background readings, which will be made available on EleUM.

Instructional Approach
Students will attend at least 15 colloquia, and will choose one topic of these colloquia to base their research proposal on. They will also provide peer reviews on two of their fellow students' research proposals.

Form of Assessment
Students are evaluated (pass/fail) on the basis of attendance, a written research proposal, and submission of two peer reviews.

2.3 Core courses

PSY4051 411CN Auditory and Higher Order Language processing – 4 credits
Coordinator: Bernadette Jansma, Cognitive Neuroscience (FPN), Phone 38 81934, 5 Universiteitssingel, Room 1.013, E-mail: b.jansma@maastrichtuniversity.nl

Objective(s)
Knowledge of the basic cognitive and neural principles of auditory and speech processing. Knowledge of cross modal integration. Critical thinking with regard to research in the domain of auditory/speech processing and cross modal integration, including event-related potential (ERP) and fMRI studies.

Key words
Auditory and cross-modal processing, language comprehension and production.

Description of the Course
Whereas the human visual system has been studied extensively in cognitive neuroscience, so far only little is known about the auditory and speech system: How do we segregate the sound of a Ferrari from the background sounds of other running car engines, or the voice of a friend from that of many others in a crowd? How is auditory information integrated with other senses such as vision or touch? In the last few years cognitive neuroscience research has set some milestones for gaining better understanding about how our brain manages these tasks. We see this knowledge as very important because hearing and communicating with the environment and with others is one of the most essential human cognitive skills.
This course aims to develop knowledge about the human auditory and speech system. We will start with basic neural anatomy and how this might constrain but also help

auditory processing. We will then learn about the basics of sound segregation and perception, and higher order spoken word recognition. In addition to these bottom-up processes we will address top-down processes, i.e. how the human mind manipulates auditory perception or how it generates speech from intentions and thoughts. We will address the link between speech perception and production in terms of speech monitoring. We will also learn about cross modal integration between vision and audition. This integration is a crucial source of information to understand how we select for relevance and optimize processing efficiency.

Literature
Journal articles and book chapters via EleUM.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written exam with open questions.

PSY4052 412CN Perception and Attention – 4 credits
Coordinator: Peter de Weerd, Cognitive Neuroscience (FPN), Phone 38 845 13, 40 Universiteitssingel East, Room 4.754, E-mail: p.deweerd@maastrichtuniversity.nl

Objective(s)
The objective of the course is to present current neuro-cognitive theories and experimental methods in the field of visual attention. Background information on the visual system's organization will also be covered.

Key words
Visual System, Visual illusions, Higher-order Motion and Object Perception, Selective Attention, Neurophysiology, Rhesus Monkey.

Description of the Course
Vision is a complex cognitive process, which provides us with a richer stream of information than any other sense. Primate visual cortex is composed of at least 30 highly interconnected functionally specialized regions. The regions where visual information first enters the cortex are called early visual areas. Neurons in these areas have relatively simple properties, and their relatively small receptive fields are arranged to form retinotopic maps of the environment on the cortex. Higher level visual processing occurs in a ventral and dorsal stream, each of which is composed of regions specialized for representation of more complex visual content (including motion, faces and places).

This network of functionally specialized perceptual regions can adapt to the task the organism is faced with. This is the case, for example, when looking for someone in a crowd, attending to one face at a time. There are different kinds of attention, but

attention can be generally described as involving some type of selection of information. When the attentional selection of information is accompanied by a behaviour (such as an eye-movement towards an interesting stimulus), attention is called 'overt'. However, there are also internal, covert forms of attention that do not require motor activity. Attention can be voluntary (controlled, top-down) or involuntary (automatic, bottom-up). Furthermore, attention can be directed to locations in space or to objects, or to features within objects.

In this course, neural mechanisms underlying these various types of attention will be studied. We will focus on recent neuroscientific research in visual perception and attention involving different empirical methods including psychophysics, neurophysiology, functional brain imaging, and evoked potentials, with an emphasis on neurophysiology.

Literature
Relevant articles and book chapters via EleUM.

Instructional Approach
Group discussions and lectures.

Form of Assessment
The exam will consist of about open questions.

PSY4054 413CN Neuroimaging: Functional MRI – 4 credits
Coordinator: Elia Formisano, Cognitive Neuroscience (FPN), Phone 38 84040, 40 Universiteitssingel East, Room 4.738, E-mail: e.formisano@maastrichtuniversity.nl

Objective(s)
Knowledge of the basic principles underlying (f)MRI. Understanding of theoretical and practical aspects related to the experimental design and data analysis in fMRI. Appreciation of potentialities and limitations of this technique in studying human brain functions.

Key words
Functional Neuroimaging, Magnetic Resonance Imaging, experimental design, analysis methods.

Description of the Course
The investigation of human brain functions using a range of imaging methods represents the most influential development in Cognitive Neuroscience in the last years.
In this course we will focus on fMRI. FMRI presents clear advantages over the other methods particularly in terms of increased spatial resolution. Since its invention in 1992, fMRI has led to major advances in understanding the neural mechanisms that underlie higher levels of human mental activity and has established a strong link between

cognitive psychology and neuroscientific research. Whereas in the other courses of the Cognitive Neuroimaging programme students are confronted with several applications of fMRI in specific cognitive domains (visual perception and attention, sensorimotor integration, auditory perception), during this course students will gain a deeper knowledge of fundamental and methodological aspects of fMRI.
The tasks will address questions such as: How can the fMRI signal be related to neural activity? How are functional images obtained with an MRI scanner? What do I need for doing a good fMRI measurement? How are "activation maps" created? Some of the tasks are directly linked to the practical part of the course and are intended to provide the necessary theoretical framework for the design, analysis, measurement and interpretation of results in fMRI investigations. Practical sessions on data acquisition and/or analysis of fMRI data of cognitive functions such as auditory and visual processing as well as mental imagery will be integrated in the group meetings.

Literature
- Huettel, S.A., Song, A.W., & McCarthy, G. (2004). *Functional Magnetic Resonance Imaging*. Sunderland, MA: Sinauer, Associates, Inc. Publishers;
- Jezzard, P., Matthews, P.M., & Smith, S.S. (2001). *Functional MRI - An Introduction to Methods*. Oxford, UK: Oxford University Press;
- Journal articles and book chapters.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written exam with open questions.

PSY4055 414CN The Cognitive Neuroscience of Sensory and Motor Systems – 4 credits

Coordinators: Alard Roebroeck, Cognitive Neuroscience (FPN), Phone 38 84039,
40 Universiteitssingel East, Room 4.749, E-mail: a.roebroeck@maastrichtuniversity.nl;
Joel Reithler, Cognitive Neuroscience (FPN), Phone 38 81896,
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Objective(s)
At the end of the course students will have been familiarized with the complexity of the processing needed to perform certain simple sensorimotor coordination tasks and will have an idea of how and where such processing is performed in the brain. Furthermore, they will learn about ways to investigate sensorimotor integration and action representations in the brain by modern cognitive neuroscience methods.

Key words
Sensorimotor coordination, reference frames, coordinate transformations, mirror neuron system.

Description of the Course
Most of the things we do every day (riding a bicycle, typing a summary, drinking a cup of coffee) require the continuous interaction of brain systems that serve sensory perception and systems that control our muscles. In other words, most of the things we do require sensorimotor integration. In this course we will study a couple of important aspects of sensorimotor integration in the brain, particularly in the context of visual perception. Since sensory perception (visual as well as auditory) is covered extensively in other courses, we will focus mainly on the motor system and the transformation and processing of sensory information to serve motor control. We start with basic processes such as: types of motor control (since visual perception takes a little time, how should students use past information to control future actions?), the representations used by primary and secondary motor areas (what is the parameter that is under ultimate control: muscle contractions, joint angles, or whole movements?) and coordinate transformations (how do students get from visual information, coded relative to the point they are looking at, to motor commands that are coded relative to the body or the object they are grasping?). Later, we will focus on higher level issues such as motor learning, predicting the actions of others, and reacting to errors in performance. All topics will be discussed in the context of cognitive neuroscience research to learn how these topics can be investigated both with classical behavioural experiments as well as with modern techniques such as functional Magnetic Resonance Imaging.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written exam with open questions.

PSY4215 415CN Advanced fMRI – 3 credits
Coordinator: Rainer Goebel, Cognitive Neuroscience (FPN), Phone 38 84014, 40 Universiteitssingel East, Room 4.753, E-mail: r.goebel@maastrichtuniversity.nl

Objective(s)
The objectives of this course are to provide and discuss: knowledge of recent models about the relationship between neural activity and the BOLD fMRI signal; detailed knowledge of deconvolution analysis for rapid event-related paradigms and approaches to generate optimal experimental designs; knowledge on how to read, analyze and visualize fMRI brain signals in real-time during an ongoing experiment; possibilities and limitations of fMRI-based neurofeedback and real-time decoding of mental states; knowledge of advanced methods of brain normalization and its importance for random-effects group analyses; opportunities and challenges of high-resolution fMRI.

Key words
fMRI, neurovascular coupling, deconvolution analysis, real-time fMRI, neurofeedback, brain normalization, high-resolution imaging.

Description of the Course
Building on the course 'Neuroimaging', this course will examine advanced topics of fMRI methodology and applications. In the first week, models of the BOLD response and its relation to neural activity will be discussed, including the role of astrocytes. In the second week, details of deconvolution analysis for rapid event-related paradigms will be presented. Furthermore, procedures to optimize stimulus presentation will be presented followed by a discussion about limitations of rapid event-related designs. In the third week, principles of real-time fMRI will be presented followed by a discussion of fMRI neurofeedback studies. In addition, machine learning techniques for the real-time decoding of mental states will be discussed. In the fourth week, advanced methods to establish correspondence between brains of different subjects are examined. The importance of brain normalization for random-effects statistical analysis, creation of probabilistic atlases and meta-analyses will be discussed. In the context of high-resolution fMRI, an integrated view of the addressed advanced topics will be finally presented.

Literature
Journal articles and book chapter.

Instructional Approach
Tutorial group meetings with paper presentation and subsequent discussion.

Form of Assessment
Presentation of paper and written essay about the presented topic.

PSY4216 416CN Magnetic Brain Stimulation (TMS) – 3 credits
Coordinator: Alexander Sack, Cognitive Neuroscience (FPN), Phone 38 84267, 40 Universiteitssingel East, Room 4.750, E-mail: a.sack@maastrichtuniversity.nl

Objective(s)
This course will provide students with an in-depth knowledge on non-invasive magnetic brain stimulation, including the mechanisms of action, the physico-physiological principles, various application protocols, and functional magnetic brain stimulation paradigms. In cognitive neuroscience as well as multi-modal imaging approaches of combining brain stimulation with brain imaging techniques simultaneously within the same experimental session.

Key words
Non-invasive brain stimulation, functional magnetic brain interference, multi-modal imaging.

Description of the Course
Since the very beginning of experimental brain research it has always been a dream of neuroscientists to not only watch the brain at work, but actually to change and modulate the neuronal activity in the brain without harming patient or subject. With the aim of Transcranial Magnetic Stimulation (TMS) we are now able to non-invasively reach into the skull of a patient or healthy subject and to temporarily alter brain activity at a specific location and a specific moment in time.
This possibility opens the door to a wide range of experimental and clinical applications. In combination with methods of functional imaging, we can now not only passively measure the brain activity during the execution of a particular function, but moreover use TMS to increase or decrease the neuronal activity in the task-related brain area in order to reveal the behavioural changes in the actual task performance. This enables us to experimentally identify those brain areas that are functionally relevant to perform a particular function. In a clinical context, TMS has also been used to treat neurological and psychiatric diseases that are accompanied by a pathologically increased or decreased activity in a specific brain region. Since TMS offers the possibility to increase or decrease neuronal activity even beyond the stimulation itself, it might in the future become a powerful therapeutic tool to help treating diseases like depression or schizophrenia.

Literature
Journal articles.

Instructional Approach
Tutorial group meetings and presentations. The presentations will be given by the students. Prior to each meeting students are assigned to different topics and prepare a short introductory lecture. After this, a classical PBL tutorial meeting follows with the assigned student acting as discussion leader.

Form of Assessment
The assessment will be based on a written final exam with open questions and performance on lectures and presentation.

PSY4217 417CN Tracking the Time-Course of Cortical Processing Using MEG and EEG – 3 credits

Coordinator: Fren Smulders, Cognitive Neuroscience (FPN), Phone 38 81909, 40 Universiteitssingel East, Room 4.777a, E-mail: f.smulders@maastrichtuniversity.nl

Objective(s)
Deepening the understanding of electroencephalographic and magnetoencephalographic data in terms of their limitations, current methods of analysis, and interpretation.

Key words
Electroencephalography, Magnetoencephalography, Biological Signal analysis, Source localization.

Description of the Course
Cognitive neuroscientists nowadays have the choice to use a range of different imaging methods to investigate human brain functions. Each of these methods has its own strengths and limitations, which have to be taken into account when investigating a particular research question. Both electroencephalography (EEG) and magnetoencephalography (MEG) have been important in characterizing the time course of activation of neural systems involved in different aspects of perceptual and cognitive processes. These processes include auditory and visual perception, attention, language, memory and development. EEG and MEG reflect complementary aspects of brain activity with some advantages of MEG over EEG in the localisation of underlying neural sources. This course intends to provide detailed knowledge on EEG and MEG that have clear advantage over the other methods in terms of temporal resolution. We will combine practical experience in designing EEG and MEG experiments, data acquisition, and data analysis with detailed literature discussions on theoretical and methodological issues. Inspired by different types of empirical questions we will discuss a range of available methods for advanced EEG and MEG analysis, including analysis in the time and frequency domains, source localization, the combination of EEG/MEG and fMRI data, independent component analysis and analyses of functional connectivity.

Literature
Journal articles and book chapters via EleUM.

Instructional Approach
Lectures and student presentations.

Form of Assessment
Presentation and paper.

PSY4218 418CN The Auditory System – 3 credits
Coordinator: Francesco di Salle, Cognitive Neuroscience, Phone 38 84038,
40 Universiteitssingel East, Room 4.759, E-mail: francesco.disalle@maastrichtuniversity.nl

Objective(s)
The course aims at providing the students with the necessary knowledge to design and execute experiments probing the auditory system functional organization. The students will become aware of the main problems in auditory fMRI and of the possibilities to optimize functional contrast to noise ratio, spatial resolution and scanning time.

Key words
Auditory system, auditory fMRI.

Description of the Course
This advanced course will provide in-depth knowledge on the auditory system and will discuss latest developments in the field of auditory processing. The exact focus will thus be influenced by most current research, but possible topics include:
The issue of gradient noise in functional Magnetic Resonance Imaging (fMRI) in experiments investigating the auditory cortex. Gradient noise is a major problem in the functional analysis of the auditory system. This is one of the reasons why relatively little is known about the auditory system compared to the visual system. However, several solutions can physically attenuate the noise, or rather decrease the impact the noise has on auditory neurophysiology or on BOLD effects;
Besides circumventing gradient noise production or its effects on auditory perception, auditory experiments require the solution of many specific methodological problems deriving from the particular functional anatomy of the central auditory system. This issue will be analyzed together with the most promising way to address the problem;
It is known for some time now that the auditory cortex is organized tonotopically. However, why the auditory cortex is organized in this way, and why there are multiple tonotopic maps in the auditory cortex, remains largely unknown;
Besides tonotopy, a second organizational dimension of the auditory cortex can be expected. What is this dimension? Amplitude and bandwidth seem to be good candidates, but other possibilities such as pitch and latency can not be fully excluded yet either. New developments in the field of fMRI might be able to provide an answer to this question;
How are music and rhythm processed in the brain? And why are they so important to humans? This question becomes even more interesting when considering the universal importance of music, and its link to, e.g., dance and speech;
After the early visual areas, visual stimuli are processed in two different pathways. Features concerning 'what' are processed in the ventral stream, whereas features concerning 'where' are processed in the dorsal stream. Is this segregation also present in the auditory system? Evidence supporting and disproving this idea will be discussed.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
A review paper.

PSY4219 419CN Neural Correlates of Consciousness – 3 credits
Coordinator: Rob de Vries, Cognitive Neuroscience (FPN), Phone 38 81894,
40 Universiteitssingel East, Room 4.767, E-mail: r.devries@maastrichtuniversity.nl

Objective(s)
Goal is to get acquainted with current theories and topics in the cognitive neuroscience of consciousness.

Key words
Consciousness, neural correlates of consciousness, neuronal synchrony, recurrent processes, theatre theory of consciousness, availability, phenomenal experience, first and third person data, memory.

Description of the Course
Many scientists nowadays who are involved in research into consciousness are optimistic about solving the mysteries of consciousness. Philosophers have a more detached attitude. They are less euphoric than most scientists about the progress in this area. The philosopher and mathematician David J. Chalmers distinguishes two types of problems in this area: simple and difficult problems. The distinction itself is trivial and yet illuminating. Simple problems are those questions that appear to deal with consciousness but are reformulated in such terms as: 'How does the brain process external stimuli?' 'How does the brain integrate incoming information into a whole?" "How does introspective and retrospective reporting of our inner psyche occur, and how reliable is it?' 'What are the cognitive effects of hard and soft drugs on our cognitive functioning?' and 'What factors influence the content of our dream reporting?' Note that this does not mean that the simple problems are not sufficiently difficult to solve. Difficult questions are, for example: 'Why do the above mentioned information processing and information production involve conscious experiences?' 'Do conscious experiences play a causal part in our actions and our mental life, and if so, what part do they play?' and 'How can a physical system create such a "thing" as conscious experience?'

Even though the difficult problem nowadays is not solvable, there is a lot to search for and to find in the inner core of consciousness. A minimal problem for every science of consciousness is: What are the neuronal correlates of consciousness? And what does the finding of those neuronal correlates tell us about the solution of the difficult problem. The first question is a scientific one. The second is still a philosophical question. The course will assess the neurocognitive ins and outs of the binding problem. We will look into the proposed neuronal correlates of Bernard Baars' global workspace theory of consciousness, we will study Ned Blocks' distinction between access- and phenomenal consciousness and Victor Lamme's theory of recurrent processes as neuronal correlate of consciousness. There will also be a meeting about emotion and consciousness. But we won't eschew to pose the 'difficult' questions in this course: the philosophical ones. We will discuss the significance of the whole enterprise. We will ask ourselves question such as: do we know more about our consciousness now than before? Will the things we have learnt help us to solve the difficult problem?

Literature
Journal articles and book chapters.

Instructional Approach
Discussion in tutorial group meetings on the basis of summaries, prepared questions and notes of the previous discussion all made by the students, lectures.

Form of Assessment
Take home exam with open questions and a paper.

PSY4106 406RM Advanced Statistics I – 2 credits

Coordinator: Nick Broers, Methodology and Statistics (FPN) Phone 38 81929,
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E-mail: nick.broers@maastrichtuniversity.nl

Objective(s)
Thorough understanding of commonly used advanced statistical methods like ANOVA and regression, and practical skill in applying these with the SPSS software. Elementary understanding of Structural Equations Modelling (SEM) using the Lisrel software.

Key words
Balanced and unbalanced between-subject ANOVA, ANCOVA, MANOVA, multiple regression, discriminant analysis, structural equations modelling (SEM, Lisrel).

Description of the Course
The course consists of six units. In the first four units, participants will be given an in-depth training in the following standard statistical methods: Factorial ANOVA for between-subject designs, analysis of covariance (ANCOVA), multivariate ANOVA (MANOVA), discriminant analysis, and multiple linear regression. Background knowledge of balanced two way factorial ANOVA and multiple regression will be assumed, and these methods will be briefly reviewed. The following advanced topics will then be covered: unbalanced factorial designs, contrast analysis, interaction, nonlinearity, quadratic effects, dummy coding, centering covariates, different coding schemes, collinearity and residuals checks, data transformation. The distinction between confounders and mediators in regression and ANCOVA is also discussed, forming a bridge from regression to structural equations modelling (SEM). The latter is an advanced multivariate method which is gaining importance in psychology but still requires special software (such as Lisrel, EQS, AMOS, or Mplus). SEM is introduced in two units, starting with causal modelling and mediation analysis in cross-sectional research, and then extending this to longitudinal research and latent variables (factors). Special attention is given to model identifiability, model equivalence, global and local goodness of fit indices, parsimony, model modification and cross-validation. Some concepts from matrix algebra are needed for SEM, and these will be briefly discussed without going into technical detail.

Literature
For each unit we will use the handout of the lecture plus a suitable book chapter or article. Details of these will be provided on EleUM. Fox (1997), Howell (2007), and Kleinbaum (1998) give a fair impression of the content and level of the first four units. Mandatory literature for the two units on SEM are the papers by Baron and Kenny (1986) and Diamantopoulos (1994).

References

- Baron, R.M. & Kenny, D.A. (1986). *The moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations*. Journal of Personality and Social Psychology, 51, 1173-1182.
- Diamantopoulos, A. (1994). *Modelling with LISREL: A guide for the uninitiated*. Journal of Marketing Management, 10, 105-136.
- Fox, J. (1997). *Applied regression analysis, linear models, and related methods*. Thousand Oaks (CA): Sage.
- Howell, D.C. (2007). *Statistical methods for psychology* (6th ed.). Belmont (CA): Thomson/ Wadsworth;
- Kleinbaum, D.G., Kupper, L.L., Muller, K.E., & Nizam, A. (1998). *Applied regression analysis and other multivariable methods* (3rd ed.). Pacific Grove (CA): Brooks/Cole.

PSY4116 Practical SPSS:
Coordinator: Nick Broers, Methodology and Statistics (FPN) Phone 38 81929,
5 Universiteitssingel, Room 1.014, and Phone 38 82274,
1 P. Debyeplein, Room B2.03 E-mail: nick.broers@maastrichtuniversity.nl

The practical consists of analysis of real data with SPSS, using the methods discussed in the lectures. There will be assignments on balanced twoway ANOVA, unbalanced twoway ANOVA, ANCOVA, multiple linear regression, MANOVA and discriminant analysis. Attention will be given to comparisons between different methods for analyzing the same data, e.g. ANCOVA and regression.

PSY4118 Practical Lisrel:
Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001,
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The practical consists of analysis of real data with Lisrel. The first practical lets the students analyze a cross-sectional study first with multiple regression and then with Lisrel, asking them to compare the two outputs and to look for similarities and differences. The second unit lets them analyze a longitudinal study with Lisrel, asking for a comparison between different models in terms of goodness of fit, parsimony and plausibility.

Each course unit includes a computer practical. The assignment (analysis of real data with SPSS or Lisrel) is discussed in a plenary meeting after the practical. Attendance at

practicals and discussion meetings is mandatory (with 100% and 85% attendance rule, respectively).

Instructional Approach
Meetings are arranged into units, consisting of lectures, self tuition, computer exercises, and plenary discussions. There are four units on ANOVA and regression methods, and two units on SEM. Each unit starts with a lecture to explain the purpose of a method and theory and assumptions behind it, and to demonstrate its application to real data. The computer practical then allows students to practice that method themselves and try to interpret the computer output guided by questions in the assignment. The results of the assignment are finally discussed in a plenary meeting.

Form of Assessment
Open book, multiple choice exam consisting of questions resembling the exercises (general theory, some elementary computations, and interpretation of computer output). The exam will consist of 18 three-choice items, 3 items per unit, relating to computer output in appendices.

PSY4107 407RM Advanced Statistics II – 3 credits

Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001, 5 Universiteitssingel, Room 1.023, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: gerard.vbreukelen@maastrichtuniversity.nl

Objective(s)
Thorough understanding of repeated measures ANOVA for within-subject and split-plot (between * within) designs, including factorial designs and covariates in repeated measures ANOVA. Elementary understanding of mixed (= multilevel) regression. Introduction to optimal design and sample size calculation.

Key words
Oneway within-subject design, multivariate versus univariate method of analysis, sphericity, epsilon adjustment, two-way within-subject design, split-plot (between*within) design, covariates In repeated measures, mixed regression, marginal models, random intercept, random slope, within-subject covariates, missing data, optimal design, sample size, power.

Description of the Course
The course consists of seven units. The first three units cover the classical repeated measures ANOVA methods for the one- and twoway within-subject design and the split-plot (between* within) design. Special attention is given to the following topics: The choice between multivariate and univariate data format and method of analysis, and the sphericity assumption and epsilon correction for violation of it. The distinction between the within-subjects and between-subjects part of a split-plot ANOVA, and how to obtain both using regression analysis on differences and averages of repeated

measures. The surprising consequences of including covariates into repeated measures ANOVA. The choice between different methods of analysis for randomized trials versus for nonrandomized group comparisons. Subsequently, three units are devoted to mixed (multilevel) linear regression for nested designs and longitudinal studies. This part starts with a unit on so-called marginal models for repeated measures as an alternative to repeated measures ANOVA in case of missing data or within-subject covariates, showing the pros and cons of various models that can be chosen for the correlational structure of repeated measures, such as compound symmetry, AR1 and unstructured. Another unit introduces the random intercept and random slope model for repeated measures as a method for investigating interindividual differences in average and trend in growth curves (longitudinal research) or time series (single trial analysis of lab experiments). The last unit on mixed regression shows the use of such random effects models for the analysis of nested designs, e.g. cluster randomized trials on a sample of at least 10 schools, or general practices or companies (with pupils, patients, or employees nested within organizations). Finally, the topic of optimal design, sample size and power is introduced in a seventh unit.

Literature
For each unit we will use the handout of the lecture plus a suitable book chapter or article. Details of these will be provided on EleUM.
For units 3 (covariates in repeated measures designs) and 6 (nested designs), the following literature will be used:

- Moerbeek, M., Van Breukelen, G.J.P., & Berger, M.P.F. (2003). *A comparison between traditional methods and multilevel regression for the analysis of multicenter intervention studies*. Journal of Clinical Epidemiology, 56, 341-350.
- Van Breukelen, G.J.P. (2006). *ANCOVA versus change from baseline: more power in randomized studies, more bias in nonrandomized studies.* Journal of Clinical Epidemiology, 59, 920-925.
- Van Breukelen, G.J.P., & Van Dijk, K.R.A. (2007). *Use of covariates in randomized controlled trials.* Journal of the International Neuropsychological Society, 13, 903-904.

PSY4117 Practical SPSS
Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001, 5 Universiteitssingel, Room 1.023, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: gerard.vbreukelen@maastrichtuniversity.nl

The practical consists of analysis of real data with SPSS, using the methods discussed in the lectures. There will be assignments on one- and twoway within-subject ANOVA, split-plot ANOVA without and with a covariate, marginal modelling of repeated measures without and with missing data, random effects modelling of repeated measures, random effects modelling of nested designs. Much attention will be given to comparisons between the results of different methods for the same data, such as repeated measures ANOVA versus regression analysis of pretest-posttest control group designs, and repeated measures ANOVA versus mixed regression of longitudinal studies with missing data.

Each course unit includes a computer practical. The assignment (analysis of real data with SPSS) is discussed in a plenary meeting after the practical.

Instructional Approach
Meetings are arranged into units, consisting of lectures, self tuition, computer exercises, and plenary discussions. There are three units on repeated measures ANOVA including covariates, three on mixed regression, and one on optimal design and sample size. Each unit starts with a lecture to explain the purpose of a method and theory and assumptions behind it, and to demonstrate its application to real data. The computer practical then allows students to practice that method themselves and try to interpret the computer output guided by questions in the assignment. The results of the assignment are finally discussed in a plenary meeting.

Form of Assessment
Open book, multiple choice exam consisting of questions resembling the exercises (general theory, some elementary computations, and interpretation of computer output).The exam will consist of multiple choice items, relating to computer output in appendices.

PSY5211 511CN Neurocognition of Literacy and Numeracy – 3 credits
Coordinator: Leo Blomert, Cognitive Neuroscience (FPN), Phone 38 81949,
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Objective(s)
To gain insights in brain processes involved in learning to read and calculate.

Key words
Cross-modal information processing, spoken and written symbol associations and processing.

Description of the Course
Learning to read and write is an indispensable skill in literate societies. It is therefore surprising that research into the brain mechanisms enabling literacy acquisition has hardly started. It is even more surprising if we consider that 4% of the population suffers from a specific problem in learning to read and write, despite a normal intelligence. This state of affairs may be contributed to the fact that learning to read and write and the failure thereof have been perceived for a long time as an educational and not a neurocognitive problem. But the deeper reason may be that our brains are evolutionary not prepared for learning a written language. Our brains are probably for a large part hardwired for perceiving and producing speech. Since written language connects symbols (letters) to speech sounds, it is tentative to assume that written language skills develop by building on the already established spoken language system. Development of numeracy may be an even more indispensable skill in our technological society. Again surprisingly brain research in this area of neurocognition

has only very recently started. Although learning arithmetic may look as artificial as learning to read it has in fact a different evolutionary background. Animals possess basic numeracy skills, so our brains may have available basic numeracy networks, but it is as yet unclear how they contribute to the development of arithmetic and math skills. The course will focus on brain studies of literacy development and failure, e.g., developmental dyslexia and on the development of numeracy skills and failure, i.e., developmental dyscalculia.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written exam with open questions.

PSY5212 512CN Modelling – 3 credits

Coordinator: Michael Capalbo, Cognitive Neuroscience, tel. 38 84037,
40 Universiteitssingel East, Room 4.741, E-mail: m.capalbo@maastrichtuniversity.nl

Objective(s)
This course aims to provide a theoretical and practical introduction into present day cognitive neuroscience modelling methods.

Key words
Dynamical systems, data processing, data analysis, classification.

Description of the Course
In present day cognitive neuroscience, psychological experiments generate large amounts of data on processes in the brain. Since the brain is a very complex dynamical system, the interpretation of these data is far from trivial. This course provides students with the basic modelling skills to induce or create models from psychological data acquired in behavioural experiments using EEG or fMRI.
The course starts with an overview of dynamical systems that can be interpreted as models of brain functioning. Examples of such models are: connectionist (or PDP) models, attractor networks, self-organizing feature maps, synfire networks, and liquid-state machines (a.k.a. echo-state networks). The latter models exhibit complex brain-like dynamics that can be read out using trainable classifiers (e.g., perceptrons).
The remainder of the course covers pre-processing, unsupervised, and supervised techniques for the analysis and the automatic classification of brain data. The main pre-processing techniques treated are Fourier transforms and multi-scale wavelet transforms. The unsupervised techniques covered range from principal component analysis to Gaussian mixtures. The supervised learning techniques include neural

networks and support vector machines.
Throughout the course, the relations between techniques and known brain mechanisms are explained. Wherever possible, the techniques are related to well-known principles in cognitive neuroscience to facilitate the understanding of the underlying principles. For instance, in the practical sessions, students learn to generate V1-like receptive-field responses from natural images, analyze oscillatory and synchronization properties of interconnected systems of integrate-and-fire neurons, generate topographical "similarity" mappings akin to cortical maps, and train classifiers to perform coordinate transforms similar to those obtained in parietal systems.
In addition, students get acquainted with a wide variety of analysis and learning techniques by applying them to real EEG or fMRI data.
At the end of the course, students perform an individual analysis and/or classification study, preferably of relevance to ongoing research. The results are reported in a brief scientific paper.

Literature
Journal articles.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written exam with open questions and a written report on a practical assignment.

2.4 Skills trainings

PSY4221 421CN EEG and ERP – 2 credits
Coordinator: Fren Smulders, Cognitive Neuroscience (FPN), Phone 38 81909, 40 Universiteitssingel East, Room 4.777a, E-mail: f.smulders@maastrichtuniversity.nl

Objective(s)
The aim of this training is to give the students hands-on experience with the experimental design, data acquisition and analysis of EEG and ERP experiments.

Key words
Electroencephalography (EEG), Event-related potentials (ERP), electrophysiology, measurement, analysis of brain potentials.

Description of the Course
EEG and ERP offer a combination of supremely precise measurement of the time course of brain processes, low cost, non-invasiveness, and widespread availability. For this reason they make a unique contribution to cognitive neuroscience. Scientific interest in them is still growing, and results have been increasingly integrated with other imaging

techniques during the last decades. A lecture and basic literature will introduce students to some background of EEG and ERP research, the terminology of the field, and the possibilities and limitations. A first topic is how to set up an experimental paradigm that is suitable for EEG and ERP measurement. Then students shall study practical measurement issues, such as electrode placement, and the types of artifacts that one may expect. Finally, there is the interpretation of the resulting data. Successful measurement requires an understanding of some basic signal analysis techniques that are specific for EEG and ERP, such as artifact management, spectral analysis, filtering, ERP averaging, time-frequency analysis etc. After that, there will be a hands-on training in smaller groups in running an ERP experiment, including electrode application, minimizing artifacts, and hygiene and safety in the lab. A simple experimental paradigm will be used that gives interesting and reliable results. Data processing will include various EEG analyses that are commonly used, e.g., analyses in the time and frequency domain.

Literature
Journal articles and handbooks.

Instructional Approach
Tutorial group meetings with student presentations, lecture, a lab session, and analysis sessions.

Form of Assessment
A paper and a practical report.

PSY4056 422CN fMRI – 2 credits

Coordinators: Elia Formisano, Cognitive Neuroscience (FPN), Phone 38 84040,
40 Universiteitssingel East, Room 4.738, E-mail: e.formisano@maastrichtuniversity.nl;
Giancarlo Valente, Cognitive Neuroscience (FPN), Phone 38 82469,
40 Universiteitssingel East, Room 4.747, E-mail: giancarlo.valente@maastrichtuniversity.nl

Objective(s)
Hands-on experience for designing, conducting and analyzing an fMRI experiment.

Key words
functional MRI, experimental design, statistical analysis.

Description of the Course
The primary goal is to get hands-on experience with the experimental design, acquisition and analysis of functional Magnetic Resonance Imaging (fMRI) experiments. Students get a general experimental question/hypothesis, which should be suitably refined to be testable in an fMRI experiment. They will then design and prepare the experiment. Their designs and experimental setups will be discussed. One/two designs will be actually implemented and scanned. Students engage in the

statistical analysis of the scanned datasets. Help and prior preparation, especially in the implementation stage (stimulus programming) and data analysis stage (preparation of data in usable format for analysis in BrainVoyager QX), will be provided by tutors. The tutorial/practicum groups will be left free to test a different hypothesis, and conduct different types of analysis. Each group will report (also to each other) and discuss their findings.

Literature
- Jezzard, P., & Smith, S.M. (2002) (Eds). *Functional MRI: An introduction to Methods*. Oxford: University Press;
- additional assigned papers.

Instructional Approach
Tutorial group meetings, lab sessions and computer sessions. Some additional work outside the sessions is expected.

Form of Assessment
Short report in abbreviated article form.

PSY4108 408RM Neuroanatomy – 1 credit

Coordinator: Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 81168,
50 Universiteitssingel, Room 1.110, E-mail: jos.prickaerts@maastrichtuniversity.nl

Objective(s)
To become acquainted with the neuroanatomical terminology and to gain insight into the spatial and functional organization of the brain.

Key words
Neuroanatomy, limbic system, basal ganglia.

Description of the Course
The aim of the training is to become acquainted with the neuroanatomical terminology and to gain insight into the spatial and functional organization of the brain. It is essential to have a basic knowledge of the brain anatomy when working in the field of neuropsychology or neurobiology. Many specific brain areas can be linked to particular functions. Thus, knowledge of the brain anatomy and its main functions allows one to directly link specific neurological or psychiatric disorders to particular brain areas. After a short theoretical introduction the students will study whole brains and brain material of mammals at both macroscopical (visual inspection) and microscopical level. The emphasis will be on major brain systems including the basal ganglia and limbic system.

Instructional Approach
Almost exclusively practical: dissection of sheep brain, studying of microscopical slices of rat brain, working with plastic human brain models, CD-ROM programs and textbook.

Form of Assessment
Pass/fail score based on written exam with open questions.

PSY4224 424CN Programming in Matlab Basic Course– 2 credits

Coordinator: Giancarlo Valente, Cognitive Neuroscience (FPN), Phone 38 82469, 40 Universiteitssingel East, Room 4.747, E-mail: giancarlo.valente@maastrichtuniversity.nl

Objective(s)
This course gives an introduction to MATLAB and to programming

Key words
MATLAB environment, variables, functions, data structures, Input/Output, basic graphics.

Description of the Course
Matlab is a powerful environment for numerical computation, data analysis and visualization. It is, in essence, a programming language that has built in primitives for common scientific tasks that require many operations in other languages, such as C or Pascal. Examples are tasks such as matrix algebra (used in statistical analysis of data), Fourier transforms (used in signal processing), or 2D or 3D plots for visualization of data or analysis-results. Many complete packages for the analysis of cognitive neuroimaging data (e.g., fMRI data or EEG/MEG data) are implemented in Matlab. Thus, usage of these packages requires at least a basic understanding of Matlab. Furthermore, if more advanced analysis or visualization is needed that is not offered by existing packages, developing such new functionality in Matlab is often the most convenient option. The first part of the course will deal with algebra and matrix decompositions as an introduction to how Matlab primarily represent and processes data: as matrices. Subsequently, we study in detail the usage of the environment: the prompt, the workspace, getting help, loading, saving and visualizing data. We introduce the principles behind programming, with particular emphasis on neuroimaging applications.

Instructional Approach
Lectures, computer sessions combined in an interactive format.

Form of Assessment
Programming exercises throughout the training and assignments.

PSY4225 425CN Programming in Matlab Advanced Course – 1 credit

Coordinator: Giancarlo Valente, Cognitive Neuroscience (FPN), Phone 38 82469,
40 Universiteitssingel East, Room 4.747, E-mail: giancarlo.valente@maastrichtuniversity.nl

Objective(s)
The objective of the course is to improve the knowledge of MATLAB programming, with particular emphasis on efficiency.

Key words
Debugging, Advanced graphics, Efficient programming.

Description of the Course
This course deals with advanced topics in Matlab programming. In particular, we will study how to implement efficient and re-usable programs for neuroimaging applications. We will learn how to use existing Matlab toolboxes for neuroimaging. The students will learn the principles of efficient programming, such as debugging and profiling. Advanced topics in graphics and user interfaces will be discussed.

Instructional Approach
Lectures, computer sessions combined in an interactive format.

Form of Assessment
Programming exercises throughout the training and assignments.

PSY4226 426CN Presentation – 1 credit

Coordinator: Francesco Gentile, Cognitive Neuroscience (FPN), Phone 38 84212,
40 Universiteitssingel East, Room 4.761, E-mail: f.gentile@maastrichtuniversity.nl

Objective(s)
To learn to present auditory and visual stimuli in different types of experimental settings.

Key words
Stimulus delivery system, auditory and visual stimuli, Presentation, SDL, programming, PCL.

Description of the Course
Presentation is a stimulus delivery and experimental control system for neuroimaging and behavioral research. Presentation does not require high programming skills and offers a very friendly way of implementing an experimental design. Presentation is able to present, control and register auditory and visual stimuli in synchrony with a measuring device in different types of experimental settings: behavioral or physiological research including fMRI, EEG, MEG or single neuron recording. With a balanced combination of lectures and computer sessions students will learn to program their own experiment first in a simple manner and finally using PCL-language.

Literature
Documentation of presentation.

Instructional Approach
Lectures and computer sessions.

Form of Assessment
Programming exercises throughout the training.

PSY5221 521CN Diffusion Weighted Imaging and Fiber Tracking – 1 credit

Coordinator: Alard Roebroeck, Cognitive Neuroscience (FPN), Phone 38 84039,
40 Universiteitssingel East, Room 4.749, E-mail: a.roebroeck@maastrichtuniversity.nl

Objective(s)
After completing this training, the student will have knowledge of i) how the MR scanner can be made sensitive to directed diffusion of water and how the resulting diffusion weighted images can be processed, ii) different models for local water diffusion within a voxel, along with useful quantities that can be derived from them, iii) fiber tracking or tractography: how to get from local models of water diffusion to measures of global connectivity between brain regions.

Key words
Water diffusion, Diffusion weighted imaging, Diffusion tensor imaging, Fiber tracking.

Description of the Course
Diffusion weighted imaging and fiber tracking are a set of techniques that use the Magnetic Resonance (MR) scanner to probe fiber-bundles that connect different regions of the brain. Thus, instead of the cerebral grey matter, it is the white matter that is the object of study. The connections between brain-regions are the substrate of the interaction and communication between different brain systems. Thus, knowledge about the anatomy of these anatomical connections is of great importance to cognitive neuroscientists. The anatomy of fiber-tracts is imaged indirectly, by measuring the diffusion of water in the brain. Water diffuses more easily parallel to the direction of surrounding axon-bundles, than perpendicular to it. Thus, by measuring the direction of local diffusion of water, we can infer something about the trajectories of fiber-bundles. After completing this training, the student will have knowledge of i) how the MR scanner can be made sensitive to directed diffusion of water and how the resulting diffusion weighted images can be processed, ii) different models for local water diffusion within a voxel, along with useful quantities that can be derived from them, iii) fiber tracking or tractography: how to get from local models of water diffusion to measures of global connectivity between brain regions. Furthermore, the student will get hands-on experience in analyzing and visualizing actual diffusion weighted MR-data, and in using tractography algorithms and assessing the results.

Literature
Journal articles and handouts.

Instructional Approach
Lectures, computer sessions, combined in an interactive format.

Form of Assessment

Analysis exercises throughout the training.

PSY5222 522CN Data Management – 1 credit

Coordinator: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81940, 40 Universiteitssingel East, Room 2.743,
E-mail: e.theunissen@maastrichtuniversity.nl

Objective(s)
To acquire basis skills in data management using the software package Excel.

Key words
Data management, data analysis, spreadsheets, graphs, Excel.

Description of the Course
This programme Exel has many features that can be very helpful to overcome time-consuming formatting of databases. First, an introduction of the basic features of Excel will be presented. Being familiar with these basic aspects is necessary to understand copying of values and formulas (relative or absolute). Also, Excel enables students to make various types of graphs, which can be very helpful for quickly visualizing data. A fourth aspect that will be dealt with is pivot tables, a very helpful tool to organize data in any manner students find most suitable for further data handling. A final option that will be dealt with is the use of macros. These are especially helpful when repetitious changes in layout or recalculations have to be made.

Instructional Approach
Group meetings with demonstrations based on student data. Students may provide the instructor with data to be used as examples.

Form of Assessment
Written assignment.

2.5 M&T workshops

PSY4231 431CN Real Time fMRI and Neurofeedback – 1 credit

Coordinator: Rainer Goebel, Cognitive Neuroscience (FPN), Phone 38 84014,
40 Universiteitssingel East, Room 4.753, E-mail: r.goebel@maastrichtuniversity.nl

Objective(s)

This workshop provides a thorough introduction in the principles of real-time fMRI and includes participation in real-time fMRI scanning sessions using the 3T Allegra MRI machine. Two students will serve as subjects communicating answers to questions as well as sending words to the operator room purely based on fMRI brain signals. In a practical data analysis session, students re-analyze the recorded data of the real-time scanning session using a real-time analysis software package (Turbo-BrainVoyager).

Key words

Real-time fMRI, neurofeedback, brain-computer interface, brain reading.

Description of the Course

Recent progress in computer hard- and software allows the real-time analysis of fMRI data providing the basis for 'neurofeedback' experiments. In such experiments, subjects see their own brain activity from selected brain regions while they are measured in the scanner. Neurofeedback is thus a way to create a "Brain-Computer Interface" (BCI), which offers interesting basic and clinical applications. Neurofeedback is performed by reading, analyzing and visualizing the fMRI brain signals in real-time during an ongoing experiment. This real-time approach is in contrast to the standard analysis approach in which the huge amount of incoming fMRI signals are recorded first and analyzed hours or days after the experiment.

fMRI neurofeedback applications are discussed, which have demonstrated that with sufficient practice, subjects are indeed able to learn to modulate activity in many brain areas. These results are very important for basic neuroscience research because they allow to study the degree to which the brain can modulate its own activity and to potentially unravel the function of hitherto unknown brain areas. Neurofeedback research also touches on deep philosophical issues, such as the neural correlates of free will. It might also be possible in the future to help people with pain or depression by regulating at will the activity in relevant brain areas. Furthermore, a real-time fMRI BCI can be used to help patients, which cannot move their body ("locked-in" state) to communicate their thoughts by "writing" letters controlled by mental strategies.

Literature

Articles and a guide to use the real-time analysis software.

Instructional Approach
A demonstration session and a practical session on two days: The first day includes an introductory lecture about real-time fMRI and the software 'Turbo-BrainVoyager'. In addition, students will attend a real-time fMRI scanning session with one or two students serving as subjects. At the second day, they learn to use Turbo-BrainVoyager to analyze themself the real-time data obtained from the scanning session of the first day.

Form of Assessment
Brief report.

PSY4233 433CN Methods of Deactivation – 1 credit

Coordinators: Teresa Schuhmann, Cognitive Neuroscience (FPN), Phone 38 82467, 40 Universiteitssingel East, Room 4.767, E-mail: t.schuhmann@maastrichtuniversity.nl; Peter de Weerd, Cognitive Neuroscience (FPN), Phone 38 84513, 40 Universiteitssingel East, Room 4.754, E-mail: p.deweerd@maastrichtuniversity.nl

Objective(s)
The objective of this workshop is to train students in using Transcranial Magnetic Stimulation (TMS) and make them acquainted with other methods of deactivation.

Key words
Transcranial Magnetic Stimulation, Non-invasive Brain Stimulation, fMRI-guided Neuronavigation.

Description of the Course
In three consecutive practical sessions, students will acquire direct hands-on experience with non-invasive magnetic brain stimulation. We will learn how to use the brain stimulator devices, how to evoke muscle responses, and how to induce visual experiences. Students will act as both the experimenter, applying the brain stimulation, as well as the participant, receiving the magnetic pulses.

Practical I: Technical Introduction / Motor Thresholds / Motor Excitability
Practical II: TMS-induced visual experiences (phosphenes)
Practical III: TMS Neuronavigation (frameless stereotaxy)

There are a variety of ways in which activity in a brain region can be prevented or influenced. Some studies use anatomical lesion methods (in animals), while others use reversible methods such as cooling, and pharmacological or genetic manipulations in animals, or transcranial magnetic stimulation (TMS) in human subjects.

The workshop will end with a lecture that gives an overview of these different methodologies, including a discussion of the advantages and limitations of the different techniques, and issues related to data interpretation.

Literature
The lecture, which includes relevant references, will be made available upon request.

Instructional Approach
Three practical sessions, followed by a lecture in an interactive format.

Form of Assessment
Completion of in-class assignments.

PSY4109 409RM Research Ethics – 1 credit

Coordinator: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81940, 40 Universiteitssingel East, Room 2.743,
E-mail: e.theunissen@maastrichtuniversity.nl

Objective(s)
To critically examine ethical issues and to learn about ethical and legal regulations in research.

Key words
Ethics, legal, guidelines.

Description of the Course
Students will learn to think critically about ethical dilemmas that psychologists encounter when exercising their profession. This workshop will discuss legal and ethical conflicts that are involved in psychological research and clinical practice. Students will be introduced to the ethical and legal rules and boundaries in human research, and to the organizations and institutes supervising the application of these rules.

Psychologists always need to make sure that they carry out their work in an ethical and legally sound way. However, there is often a conflict of interests of the involved parties. In all circumstances, however, it is the psychologist's primary task to secure the patients/participants welfare and to keep risks at a minimum. Therefore psychologists should know which ethical aspects are of importance and which laws and rules need to be applied and also which institutions supervise on the application of these rules. In addition, these aspects should be taken into consideration when writing and submitting a research proposal to an ethical commission.
The following topics will be discussed:
- Examples of ethical and legal failings
- Necessity of ethical and legal rules
- Different guidelines: declaration of Helsinki, guidelines for Good Clinical Practice, etc.

- Working with participants/patients: rights and duties, confidentiality, data processing and storage, etc.
- Applying ethical and legal rules in e.g., protocol, case report form, informed consent, etc.
- Ethical and legal reviews.

Literature
Links to relevant literature on EleUM.

Instructional Approach
Lectures and discussion groups.

Form of Assessment
Presentation.

PSY4235 435CN & PSY4236 436CN Signal Analysis I & II – 4 credits
Coordinators: Giancarlo Valente, Cognitive Neuroscience (FPN), Phone 38 82469, 40 Universiteitssingel East, Room 4.747, E-mail: giancarlo.valente@maastrichtuniversity.nl; Fabrizio Esposito, Cognitive Neuroscience (FPN), Phone 38 84064, 40 Universiteitssingel East, Room 1.773, E-mail: fabrizio.esposito@maastrichtuniversity.nl

Objective(s)
To learn the principles and the practical implementation of traditional and new approaches for the analysis of neurophysiological signals.

Key words
Signal representation, frequency analysis, time-frequency analysis, multivariate analysis, MATLAB.

Description of the Course
Traditional and advanced statistics provide essential knowledge and tools for the correct formulation of scientific inferences and to summarize a research work. Nonetheless, modern techniques in neuroscience research have strongly enriched the amount of information that is possible to extract and analyze from experimental data, especially because of the improved spatial and temporal resolution of the acquisition methods. Most of the new information can be recovered by including in the statistical modelling the "signal" structure of the data, generally due to the physical dimensions of data, time and space. The two "Signal Analysis" courses introduce the practical implementation of the traditional and latest research approaches to time and space signal analysis in the context of neuroscience research.

The first course (Signal Analysis I) focuses on time series analysis from one- and multi-dimensional data, with special emphasis to image time-series processing. The basics of discrete time and space signal acquisition and modelling are presented and discussed

in their practical neuroscience applications. The course has the objective to provide the participants with operational understanding of the classical signal analysis techniques like pre-processing, analysis in the frequency, time and amplitude domains, Fourier series, Fourier Transform and FFT, spectral analysis, auto- and cross-correlation analysis, convolution and deconvolution analysis. Practical demonstrations from real world data will reinforce concepts introduced in the lectures, and concise mathematical tutorials will be provided to simplify further readings from the technical literature. MATLAB implementation of these techniques will also be addressed throughout the meetings

The second course (Signal Analysis II) introduces the participants to emerging advanced signal analysis techniques, including multivariate component-based analysis and multiresolution wavelet-based time and space signal processing. The course will also deal with state of the art predictive modelling and machine learning for fMRI data analysis, including Bayesian approaches. Lab sessions in MATLAB will be held during the meetings.

Literature
Journal articles and book chapters.

Instructional Approach
Lectures, tutorial group meetings with integrated practical sessions.

Form of Assessment
Written exam with open questions, and assignment.

PSY5101 501RM Advanced Academic Writing – 2 credits

Coordinator: Caroline van Heugten, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 84091, 12 Dr. Tanslaan, Room 4.E3.017, E-mail: c.vanheugten@maastrichuniversity.nl

Objective(s)
The goals of the course are to familiarize the Research Master's students with the academic writing process involving research protocols, grant proposals, scientific papers and posters. A variety of academic writing skills will be practiced.

Key words
Writing skills, research protocol, author guidelines.

Description of the Course
During this course, students will be familiarized with the different phases of writing scientific products, such as research protocols, scientific publications, grant proposals and scientific posters. In advance of their upcoming career as a scientist and in the nearby future their masters thesis, they will learn to define and crystallize a research question based on its feasibility and scientific relevance; to prepare and structure their

arguments and to plan the different parts of the paper; to think about suitable designs and research methods for data acquisition and analysis, and, finally, to learn how to walk through the writing process starting from draft to the final version. The student will get acquainted with the competitive nature of academic writing in an exercise environment. This all will be accomplished by competence-based learning in which they have to integrate factual knowledge (from the literature) into skill-based practice (by exercise).

Instructional Approach
A combination of lectures, take home writing assignments and take home review assignments, a workgroup meeting with poster presentations.

Form of Assessment
A positive evaluation of this workshop is based on:
- attendance at the lectures;
- fulfilling all take-home writing and review assignments;
- writing a final research proposal of sufficient quality (introduction/theoretical background and method/workplan); feedback about the proposal will be given on an individual level;
- presenting a poster.

2.6 Research internship and Master's thesis

PSY5102 502RM Research internship and PSY5103 Master's thesis – 50 credits
Coordinator: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 82181, 40 Universiteitssingel East, Room 2.755,
E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
Conduct an empirical research project under supervision resulting in a thesis.

Key words
Internship, research, Master's thesis.

Description of the internship
The second part of the 2nd year of the Research Master's programme is devoted to arranging and conducting a research internship. As a result of the many international research contacts our faculty members have established, a substantial number of students will conduct their research internship abroad. Students finalize the Master's programme by writing a thesis on their internship.

The internship can be done at Maastricht University or at external research institutes. In all cases, two assessors will evaluate the research proposal and Master's thesis. At least

one assessor has to be a member of the Faculty of Psychology and Neuroscience (FPN) or the Faculty of Health, Medicine and Life Sciences (FHML). The other assessor might be a (senior) researcher at, for example, the institute where the data are collected.
A detailed guide on research internships and Master's thesis can be found on EleUM > Students Research Master Faculty of Psychology and Neuroscience > internships.

Form of Assessment
Credits will be assigned on the basis of the proposal and research activities (36 credits, pass/fail assessment) as well as the thesis (14 credits, graded assessment).

For more information about research internships contact the general coordinator or go directly to the internship contact of the specific specialization programme:

General Coordinator Internships: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 82181, 40 Universiteitssingel East, Room 2.755, E-mail: bart.scholtissen@maastrichtuniversity.nl

Cognitive Neuroscience: Milene Bonte, Cognitive Neuroscience (FPN) Phone 38 84036, 40 Universiteitssingel East, Room 4.777, E-mail: m.bonte@maastrichtuniversity.nl

2.7 Schedule Cognitive Neuroscience

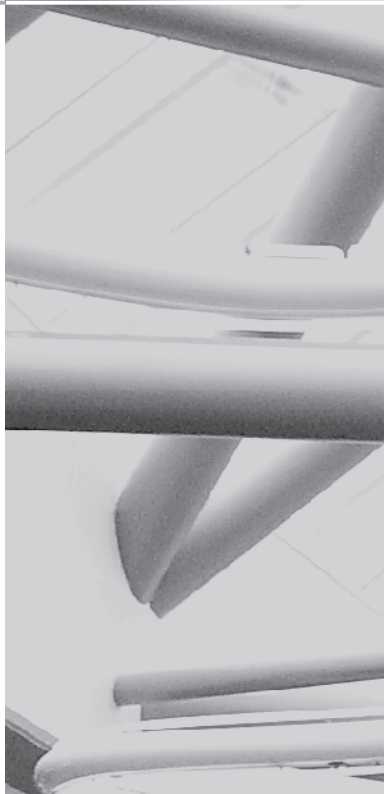
Period	YEAR 1
Period 0, 1 week 31th August - 4th September 2009	Introduction Week
Period 1, 7 weeks 7th September – 23th October 2009	**PSY4105 405RM Interdisciplinary Perspectives** (total of 3 credits)
	Core Courses: PSY4051 411CN Auditory and Higher Order Language processing (4 credits), PSY4052 412CN Perception and Attention (4 credits) & PSY4106 406RM Advanced Statistics I (total of 2 credits)
	Skill Training: PSY4221 421CN EEG and ERP (2 credits)
	PSY4100 404RM Colloquia (total of 5 credits)
Period 2, 7 weeks 26th October – 11th December 2009	**PSY4105 405RM Interdisciplinary Perspectives**
	Core courses: PSY4054 413CN Neuroimaging: Functional MRI (4 credits), PSY4055 414CN The Cognitive Neuroscience of Sensory and Motor Systems (4 credits) & PSY4106 406RM Advanced Statistics I
	Skill training: PSY4056 422CN fMRI (2 credits)
	PSY4100 404RM Colloquia
Christmas break	
Period 3, 4 weeks 4th January – 29th January 2010	**Core course:** PSY4215 415CN Advanced fMRI (3 credits) & PSY4106 406RM Advanced Statistics I
	Workshop: PSY4231 431CN Real time fMRI and Neurofeedback (1 credit)
	Skill training: PSY4108 408RM Neuroanatomy (1 credit)
	PSY4100 404RM Colloquia

Period 4, 5 weeks 1st February – 5th March 2010	**Core course:** PSY4216 416CN Magnetic Brain Stimulation (TMS) (3 credits) & PSY4107 407RM Advanced Statistics II (total of 3 credits)
	Workshop: PSY4233 433CN Methods of Deactivation (1 credit)
	Skill training: PSY4224 424CN Programming in Matlab Basic Course (2 credits)
	PSY4100 404RM Colloquia
Period 5, 4 weeks 8th March – 2nd April 2010	**Core course:** PSY4217 417CN Tracking the Time-Course of Cortical Processing Using MEG and EEG (3 credits) & PSY4107 407RM Advanced Statistics II
	Workshop: PSY4109 409RM Research Ethics (1 credit)
	Skill training: PSY4225 425CN Programming in Matlab Advanced Course (1 credit)
	PSY4100 404RM Colloquia
Period 6, 5 weeks 12th April – 12th May 2010	**Core course:** PSY4218 418CN The Auditory System (3 credits)
	Workshop: PSY4235 435CN Signal Analysis I (2 credits)
	Skill training: PSY4226 426CN Presentation (1 credit)
	PSY4100 404RM Colloquia
Period 7, 5 weeks 17th May – 18th June 2010	**Core course:** PSY4219 419CN Neural Correlates of Consciousness (3 credits)
	Workshop: PSY4236 436CN Signal Analysis II (2 credits)
	PSY4100 404RM Colloquia

Period	YEAR 2
Period 1, 4 weeks 31th August - 25th September 2009	**Core course:** PSY5211 511CN Neurocognition of Literacy and Numeracy (3 credits)
	Workshop: PSY5101 501RM Advanced Academic Writing (total of 2 credits)
	Skill training: PSY5221 521CN Diffusion Weighted Imaging and Fiber Tracking (1 credit)
Period 2, 4 weeks 28th September - 23th October 2009	**Core course:** PSY5212 512CN Modelling (3 credits)
	Workshop: PSY5101 501RM Advanced Academic Writing
	Skill training: PSY5222 522CN Data Management (1 credit)
32 weeks	**PSY5102 502RM Research internship & PSY5103 Master's thesis** (50 credits)

3

Specialization Fundamental Neuroscience (FN)



The specialization in fundamental neuroscience provides students with both the theoretical background and practical experience of researchers at the interface between neuroscience and psychology. The other specializations within the Research Master offer a formal education in brain imaging at a macro level (observing brain activity), as well as neuropsychology (brain-behaviour relationships) and psychopathology (mental health). Fundamental neuroscience adds the cellular micro level (investigations into single brain cells) and offers interdisciplinary cross-integration in a neuroscience context. The focus is on acquiring the molecular biological (e.g., proteomics, genomics), neuroanatomical (e.g., immunocytochemistry), electrophysiological (e.g., EEG, ERP), and behavioural techniques (e.g., rodent and human tests) necessary for preclinical basic research. In addition, the specialization provides an in-depth study into state-of-the-art knowledge of physiological and pathophysiological mechanisms underlying psychological, psychiatric and neurological disorders (e.g. affective disorders, cognitive disorders, motor disorders). Within this context, the role of the emerging field of neuroinflammation is also studied. Main research topics include cell signalling, brain plasticity, neurodegeneration, regeneration, genetics and epigenetics in a translational, that is both animal and human, setting. Teaching is presented by a multidisciplinary team from the Faculty of Psychology and Neuroscience (FPN) and, in particular, the School for Mental Health and Neuroscience of the Faculty of Health, Medicine and Life Sciences (FHML). The staff consists of professionals from relevant disciplines and includes biological psychologists, molecular biologists, neuropsychologists, neurobiologists, neuroanatomists, psychopharmacologists, immunologists and psychiatrists. The specialization Fundamental Neuroscience trains researchers to be equipped for investigations into the underlying fundamental molecular mechanisms of psychological and psychiatric disorders in academic as well as industrial settings.

Fundamental Neuroscience Coordinator:

Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and
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3.1 Interdisciplinary Perspectives

PSY4105 405RM Interdisciplinary Perspectives – 3 credits

Coordinators: Nancy Nicolson, Psychiatry and Neuropsychology (FHML),
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Objective(s)
To understand and integrate research approaches from distinct but related disciplines.

Key words
Memory, developmental psychology.

Description of the Course
This lecture course, attended by all first-year students, is designed to highlight selected research topics from the perspectives of cognitive neuroscience, fundamental neuroscience, neuropsychology and psychopathology. The aim is to illustrate how the distinct but inter-related approaches to questions in the field of brain and behaviour can enrich our understanding of underlying mechanisms as well as cognitive, emotional and behavioural outcomes in health and disorder.

Instructional Approach
A series of four lectures for each of two broad themes. Faculty members from each of the four specializations will present lectures in successive weeks.
Required readings, assigned by each lecturer, will be made available prior to the first meeting of a new theme.

Form of Assessment
Following each series of four lectures, an exam will be given, covering material from all of the assigned readings and lectures for that theme. A final pass/fail score is based on the average grade obtained on the two exams.

3.2 Colloquia

PSY4100 404 RM Colloquia – 5 credits
Coordinators: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 81940, 40 Universiteitssingel East, Room 2.743, E-mail: E.Theunissen@maastrichtuniversity.nl;
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Anne Roefs, Clinical Psychological Science (FPN), Phone 38 82191, 40 Universiteitssingel East, Room 3.747, E-mail: A.Roefs@maastrichtuniversity.nl;
Harry Steinbusch, Psychiatry and Neuropsychology (FHML), Phone 38 81021, 50 Universiteitssingel, Room 1.112, E-mail: h.steinbusch@np.unimaas.nl

Objective(s)
The purpose of the colloquia is to foster interdisciplinary knowledge and interaction among students from different specializations and with varying interests. In addition, the assignments provide students with valuable practice in writing research proposals and in peer reviewing - two extremely important skills for a young scientist.

Key words
Interdisciplinary knowledge, research proposal, peer review.

Description of the Course
Weekly colloquia are presented by UM faculty and by visiting guest lecturers. The colloquia focus in depth on one of a wide range of topics, with issues transcending the courses and even the specializations. Each colloquium will consist of a lecture followed by active discussion, prepared and chaired by the lecturer (for guest lecturers, the UM host may fill this role). Each specialization will organize 7 or more colloquia so that a total of approximately 24 colloquia will be offered each year.

Literature
Most colloquium speakers will provide background readings, which will be made available on EleUM.

Instructional Approach
Students will attend at least 15 colloquia, and will choose one topic of these colloquia to base their research proposal on. They will also provide peer reviews on two of their fellow students' research proposals.

Form of Assessment
Students are evaluated (pass/fail) on the basis of attendance, a written research proposal, and submission of two peer reviews.

3.3 Core courses

PSY4311 411FN **Introduction to Molecular and Biochemical Techniques – 4 credits**

Coordinator: Pilar Martínez Martínez, Psychiatry and Neuropsychology (FHML), Phone 38 812 63, 50 Universiteitssingel, Room 1.136, E-mail: p.martinez@np.unimaas.nl

Objective(s)
To gain understanding of current biotechniques in research laboratories. To become familiarized with concepts pertaining to basic molecular biology and biochemical principles and techniques for understanding their applications in various contemporary areas of research. To be able to communicate with co-workers in various areas of molecular biology and biochemistry.

Key words
RNA, DNA, protein isolation, ELISA, RIA, PCR, Western blot.

Description of the Course
This course focuses on fundamental biological concepts including cellular organization,

DNA, RNA and proteins. Additionally, this course will provide students with a conceptual and practical understanding of the most important techniques in molecular neuroscience. Students are made familiar with selected aspects of molecular biology that provide the non-specialist with the principles for understanding the structure and functional relationships of molecular biology techniques including DNA manipulation, cloning, RNA isolation and characterization, analysis of expression, copy DNA (cDNA) synthesis and Real-Time-PCR (RT-PCR). Students learn to purify native proteins and to produce recombinant proteins as well as to perform a radioimmunoassay (RIA) and enzyme-linked immunosorbent assay (ELISA).
Of note, this introduction course has to be taken by students with a psychological background. The parallel course PSY4312 412FN has to be taken by students with a biological background. Thus, students have to do either PSY4311 411FN or PSY4312 412FN. The course coordinators of both courses will evaluate which of the two courses a student has to do.

Literature
Journal articles and book chapters.

Instructional Approach
Lectures, group meetings, practical sessions.

Form of Assessment
Presentation, written assignment and evaluation of practical performance.

PSY4312 412FN Introduction to Psychology – 4 credits

Coordinator: Tim Leufkens, Neuropsychology and Psychopharmacology (FPN),
Phone 38 817 56, 40 Universiteitssingel East, Room 2.737,
E-mail: t.leufkens@maastrichtuniversity.nl

Objective(s)
The aim of the course is to get an overview of the field of human cognitive psychology.

Key words
Social Psychology, personality, perception, thought and reasoning, language, and consciousness.

Description of the Course
In this course students acquire an overview of human cognitive psychology. A selected number of psychological themes will be covered trying to gain knowledge on how humans act, how they interact, how they differ from each other, how they perceive, how they think, reason and speak, and how they know. The course focuses on 'normal' human performance, but malfunction and psychopathology will be covered as well. The major emphasis of the course is on understanding human behaviour by means of cognitive, non-biological theories and paradigms.

Of note, this introduction course has to be taken by students with a biological background. The parallel course PSY4311 411FN has to be taken by students with a psychological background. Thus, students have to do either PSY4311 411FN or PSY4312 412FN. The course coordinators of both courses will evaluate which of the two courses a student has to do.

Literature

Journal articles and book chapters.

Instructional Approach
Lectures, group meetings, practical sessions.

Form of Assessment
Presentation, written assignment and evaluation of practical performance.

PSY4315 413FN Biopsychological Neuroscience – 4 credits

Coordinator: Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 81168,
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Objective(s)
To become acquainted with the biology underlying fundamental psychological processes.

Key words
Neurotransmitters, hormones, signal transduction, memory, affect, motivation.

Description of the Course
This course provides an in depth description of biopsychological concepts that are relevant to the field of neuroscience. It covers elements from functional neuroanatomy, neurophysiology and psychopharmacology, as applied to brain and behaviour research. Major emphasis will be on the macro- and microanatomy of the brain and on molecular, that is neurochemical and neurobiological, mechanisms related to neurotransmission, hormones and drug action. With respect to 'function', an elaboration will be given of processes underlying sexual behaviour, affective behaviour, motivated behaviour and cognitive processes.

Literature
Journal articles and book chapters.

Instructional Approach
Lectures, group meetings, practical sessions.

Form of Assessment
Presentation, written assignment and evaluation of practical performance.

PSY4313 414FN Neuroanatomy – 4 credits

Coordinator: Marijke Lemmens, Psychiatry and Neuropsychology (FHML), Phone 38 81033, 50 Universiteitssingel, Room 1.132, E-mail: m.lemmens@np.unimaas.nl

Objective(s)
To become acquainted with the neuroanatomical terminology and to gain insight into the spatial and functional organization of the brain
Acquire macroscopical (eg. dissection of brain) and microscopical (eg. staining techniques) skills.

Key words
Neuroanatomy, glia, neurons, fibers, blood brain barrier, ventricular system, immunohistochemistry.

Description of the Course
The aim of the training is to become acquainted with the neuroanatomical terminology and to gain insight into the spatial and functional organization of the brain. It is essential to have a basic knowledge of the brain anatomy when working in the field of molecular neuroscience. Many specific brain areas can be linked to particular functions. Thus, knowledge of the brain anatomy and its main functions allows one to directly link specific neurological or psychiatric disorders to particular brain areas. After a theoretical introduction the students will study whole brains and brain material of mammals at both the macroscopical (visual inspection) and microscopical level. For the latter this course introduces the principles of multi-colour fluorescent labeling of tissue sections using antibodies and fluorescent receptor ligands. In addition, various other methods of modern brain imaging (both in vivo and ex vivo) will be discussed.

Literature
The students will be provided with selected chapters from a textbook.

Instructional Approach
The instructional approach will comprise some systematic lectures and various practical elements such as dissection of sheep brains, studying of microscopical slices of the rat brain and working with plastic human brain models.

Form of Assessment
Written examination and evaluation of practical performance.

PSY4314 415FN Neurodegeneration - 4 credits

Coordinator: Fred van Leeuwen, Psychiatry and Neuropsychology (FHML), Phone 38 31044, 50 Universiteitssingel, Room 1.116, E-mail: f.vanleeuwen@np.unimaas.nl

Objective(s)
To become acquainted with the different types of neurodegeneration as assessed by classic histochemical and molecular techniques

Key words
Tauopathies (e.g. Alzheimer's), Synucleinopathies (e.g. Parkinson), Polygutamine diseases (Huntington), neurodegenerative mechanisms

Description of the Course
This course provides an in depth description of neurodegenerative processes that occur during the development of neurodegenerative diseases, some of the most debilitating disorders that include Alzheimer's Disease, Parkinson's Disease, Huntington's disease and Amyotrophic Lateral Sclerosis. Although clinical manifestations of these neurodegenerative diseases are different, they share common features in neuropathology and in the underlying molecular mechanisms. As they share inclusions e.g. plaques and tangles) with accumulations of aberrant proteins, the modern terminology for them is conformational diseases. The aim of this course is to gain insight into the neurodegenerative processes, such as the deposition of aggregated proteins, the loss of neurons and synapses, alterations in neurogenesis and inflammatory processes, and alterations in metabolic/oxidative state, and whether these are cause or consequence of the disease. Moreover, it will cover the influences of genetic and environmental factors on disease progression and strategies for therapy. Major emphasis will be on the molecular, that is neurochemical and neurobiological, mechanisms that affect disease progression, using transgenic animal models as well as brain cell cultures.

Literature
Journal articles and book chapters.

Instructional Approach
Lectures, group meetings, practical sessions.

Form of Assessment
Written assignment and evaluation of practical performance.

PSY4106 406RM Advanced Statistics I – 2 credits

Coordinator: Nick Broers, Methodology and Statistics (FPN) Phone 38 81929, 5 Universiteitssingel, Room 1.014, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: nick.broers@maastrichtuniversity.nl

Objective(s)
Thorough understanding of commonly used advanced statistical methods like ANOVA and regression, and practical skill in applying these with the SPSS software. Elementary understanding of Structural Equations Modelling (SEM) using the Lisrel software.

Key words
Balanced and unbalanced between-subject ANOVA, ANCOVA, MANOVA, multiple regression, discriminant analysis, structural equations modelling (SEM, Lisrel).

Description of the Course
The course consists of six units. In the first four units, participants will be given an in-depth training in the following standard statistical methods: Factorial ANOVA for between-subject designs, analysis of covariance (ANCOVA), multivariate ANOVA (MANOVA), discriminant analysis, and multiple linear regression. Background knowledge of balanced two way factorial ANOVA and multiple regression will be assumed, and these methods will be briefly reviewed. The following advanced topics will then be covered: unbalanced factorial designs, contrast analysis, interaction, nonlinearity, quadratic effects, dummy coding, centering covariates, different coding schemes, collinearity and residuals checks, data transformation. The distinction between confounders and mediators in regression and ANCOVA is also discussed, forming a bridge from regression to structural equations modelling (SEM). The latter is an advanced multivariate method which is gaining importance in psychology but still requires special software (such as Lisrel, EQS, AMOS, or Mplus). SEM is introduced in two units, starting with causal modelling and mediation analysis in cross-sectional research, and then extending this to longitudinal research and latent variables (factors). Special attention is given to model identifiability, model equivalence, global and local goodness of fit indices, parsimony, model modification and cross-validation. Some concepts from matrix algebra are needed for SEM, and these will be briefly discussed without going into technical detail.

Literature
For each unit we will use the handout of the lecture plus a suitable book chapter or article. Details of these will be provided on EleUM. Fox (1997), Howell (2007), and Kleinbaum (1998) give a fair impression of the content and level of the first four units. Mandatory literature for the two units on SEM are the papers by Baron and Kenny (1986) and Diamantopoulos (1994).

References

- Baron, R.M. & Kenny, D.A. (1986). *The moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations*. Journal of Personality and Social Psychology, 51, 1173-1182.
- Diamantopoulos, A. (1994). *Modelling with LISREL: A guide for the uninitiated*. Journal of Marketing Management, 10, 105-136.
- Fox, J. (1997). *Applied regression analysis, linear models, and related methods*. Thousand Oaks (CA): Sage.
- Howell, D.C. (2007). *Statistical methods for psychology* (6th ed.). Belmont (CA): Thomson/ Wadsworth;
- Kleinbaum, D.G., Kupper, L.L., Muller, K.E., & Nizam, A. (1998). *Applied regression analysis and other multivariable methods* (3rd ed.). Pacific Grove (CA): Brooks/Cole.

PSY4116 Practical SPSS
Coordinator: Nick Broers, Methodology and Statistics (FPN) Phone 38 81929,
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The practical consists of analysis of real data with SPSS, using the methods discussed in the lectures. There will be assignments on balanced twoway ANOVA, unbalanced twoway ANOVA, ANCOVA, multiple linear regression, MANOVA and discriminant analysis. Attention will be given to comparisons between different methods for analyzing the same data, e.g. ANCOVA and regression.

PSY4118 Practical Lisrel
Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001,
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The practical consists of analysis of real data with Lisrel. The first practical lets the students analyze a cross-sectional study first with multiple regression and then with Lisrel, asking them to compare the two outputs and to look for similarities and differences. The second unit lets them analyze a longitudinal study with Lisrel, asking for a comparison between different models in terms of goodness of fit, parsimony and plausibility.

Each course unit includes a computer practical. The assignment (analysis of real data with SPSS or Lisrel) is discussed in a plenary meeting after the practical. Attendance at practicals and discussion meetings is mandatory (with 100% and 85% attendance rule, respectively).

Instructional Approach
Meetings are arranged into units, consisting of lectures, self tuition, computer exercises, and plenary discussions. There are four units on ANOVA and regression methods, and two units on SEM. Each unit starts with a lecture to explain the purpose of a method and theory and assumptions behind it, and to demonstrate its application to real data. The computer practical then allows students to practice that method themselves and try to interpret the computer output guided by questions in the assignment. The results of the assignment are finally discussed in a plenary meeting.

Form of Assessment
Open book, multiple choice exam consisting of questions resembling the exercises (general theory, some elementary computations, and interpretation of computer output). The exam will consist of 18 three-choice items, 3 items per unit, relating to computer output in appendices.

PSY4107 407RM Advanced Statistics II – 3 credits

Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001, 5 Universiteitssingel, Room 1.023, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: gerard.vbreukelen@maastrichtuniversity.nl

Objective(s)

Thorough understanding of repeated measures ANOVA for within-subject and split-plot (between * within) designs, including factorial designs and covariates in repeated measures ANOVA. Elementary understanding of mixed (= multilevel) regression. Introduction to optimal design and sample size calculation.

Key words

Oneway within-subject design, multivariate versus univariate method of analysis, sphericity, epsilon adjustment, two-way within-subject design, split-plot (between*within) design, covariates In repeated measures, mixed regression, marginal models, random intercept, random slope, within-subject covariates, missing data, optimal design, sample size, power.

Description of the Course

The course consists of seven units. The first three units cover the classical repeated measures ANOVA methods for the one- and twoway within-subject design and the split-plot (between* within) design. Special attention is given to the following topics: The choice between multivariate and univariate data format and method of analysis, and the sphericity assumption and epsilon correction for violation of it. The distinction between the within-subjects and between-subjects part of a split-plot ANOVA, and how to obtain both using regression analysis on differences and averages of repeated measures. The surprising consequences of including covariates into repeated measures ANOVA. The choice between different methods of analysis for randomized trials versus for nonrandomized group comparisons. Subsequently, three units are devoted to mixed (multilevel) linear regression for nested designs and longitudinal studies. This part starts with a unit on so-called marginal models for repeated measures as an alternative to repeated measures ANOVA in case of missing data or within-subject covariates, showing the pros and cons of various models that can be chosen for the correlational structure of repeated measures, such as compound symmetry, AR1 and unstructured. Another unit introduces the random intercept and random slope model for repeated measures as a method for investigating interindividual differences in average and trend in growth curves (longitudinal research) or time series (single trial analysis of lab experiments). The last unit on mixed regression shows the use of such random effects models for the analysis of nested designs, e.g. cluster randomized trials on a sample of at least 10 schools, or general practices or companies (with pupils, patients, or employees nested within organizations). Finally, the topic of optimal design, sample size and power is introduced in a seventh unit.

Literature
For each unit we will use the handout of the lecture plus a suitable book chapter or article. Details of these will be provided on EleUM.
For units 3 (covariates in repeated measures designs) and 6 (nested designs), the following literature will be used:

- Moerbeek, M., Van Breukelen, G.J.P., & Berger, M.P.F. (2003). *A comparison between traditional methods and multilevel regression for the analysis of multicenter intervention studies.* Journal of Clinical Epidemiology, 56, 341-350.
- Van Breukelen, G.J.P. (2006). *ANCOVA versus change from baseline: more power in randomized studies, more bias in nonrandomized studies.* Journal of Clinical Epidemiology, 59, 920-925.
- Van Breukelen, G.J.P., & Van Dijk, K.R.A. (2007). *Use of covariates in randomized controlled trials*. Journal of the International Neuropsychological Society, 13, 903-904.

PSY4117 Practical SPSS
Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001, 5 Universiteitssingel, Room 1.023, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: gerard.vbreukelen@maastrichtuniversity.nl

The practical consists of analysis of real data with SPSS, using the methods discussed in the lectures. There will be assignments on one- and twoway within-subject ANOVA, split-plot ANOVA without and with a covariate, marginal modelling of repeated measures without and with missing data, random effects modelling of repeated measures, random effects modelling of nested designs. Much attention will be given to comparisons between the results of different methods for the same data, such as repeated measures ANOVA versus regression analysis of pretest-posttest control group designs, and repeated measures ANOVA versus mixed regression of longitudinal studies with missing data.

Each course unit includes a computer practical. The assignment (analysis of real data with SPSS) is discussed in a plenary meeting after the practical.

Instructional Approach
Meetings are arranged into units, consisting of lectures, self tuition, computer exercises, and plenary discussions. There are three units on repeated measures ANOVA including covariates, three on mixed regression, and one on optimal design and sample size. Each unit starts with a lecture to explain the purpose of a method and theory and assumptions behind it, and to demonstrate its application to real data. The computer practical then allows students to practice that method themselves and try to interpret the computer output guided by questions in the assignment. The results of the assignment are finally discussed in a plenary meeting.

Form of Assessment
Open book, multiple choice exam consisting of questions resembling the exercises (general theory, some elementary computations, and interpretation of computer

output).The exam will consist of multiple choice items, relating to computer output in appendices.

PSY4336 416FN Neuroplasticity and Pain – 4 credits

Coordinator: Ronald Deumens, Psychiatry and Neuropsychology (FHML), Phone 38 81057, 50 Universiteitssingel, Room 1.104, E-mail: r.deumens@np.unimaas.nl

Objective(s)
Understand the cellular and molecular biology of physiological and pathological pain. Gain insights into how clinical questions are addressed in animal or in vitro models and how such preclinical data can be translated back to clinical progress in pain management.

Key words
Peripheral nerve injuries, central nerve injuries, pain management, glia, cell cultures, algesimetry, central sensitization, neuroinflammation, neuroplasticity

Description of the Course
Physiological nociceptive pain is protective and helps us to deal with potentially threatening or damaging environmental stimuli. However, pathological pain is mostly maladaptive and often refractory to treatment. Neuroinflammation and particularly activation of central glia (microglia and astroglia) contribute largely to the neuroplasticity underlying pathological pain. Neuroplasticity includes the phenomenon of central sensitization in which central pain neurons become hyperresponsive to incoming stimuli. This course will focus primarily on the role of activated glial cells in neuroplasticity and pathological pain following peripheral and central nerve injuries. There are practical sessions on nerve surgeries and algesimetry (demonstrations). In addition, students acquire skills in cell culturing by modelling neuroinflammation in vitro.

Literature
Journal articles and book chapters.

Instructional Approach
Lectures, group meetings, practical sessions.

Form of Assessment
Presentation, written assignment and evaluation of practical performance.

PSY4316 417FN Neurological Disorders – 4 credits

Coordinator: Govert Hoogland, Neurosurgery / Psychiatry and Neuroscience (FHML), Phone 38 81024, 50 Universiteitssingel, Room 1.130, E-mail: g.hoogland@np.unimaas.nl

Objective(s)
Learn translational research approaches for neurological disorders (i.e., epilepsy and movement disorders).

Key words
Epilepsy, movement disorders, genetics, electrophysiology, functional neurosurgery.

Description of the Course
Neurological disorders such as epilepsy and movement disorders (e.g. Parkinson's disease, Huntington's disease) arise from a primary structural / molecular lesion (e.g. trauma, disrupted brain development, gene defect) followed by a chronic process of neuronal network reorganization. Once this process has reached a critical stage the patient will manifest clinically observable symptoms. Though drug therapy is the first choice in treating patients with neurological disorders, this introduces side effects and pharmacoresistance in a considerable number of patients. Hence, alternative treatment options are explored of which some are established and some are still in an experimental stage. Surgical treatment strategies aim at restoring the function of the pathologic neuronal network by: i) electrical modulation of the network, ii) disrupting or isolating the pathologic network by resective surgery, and iii) building new networks by gene therapy, stem cell transplantation or induction of cytogenesis. One of the challenges this approach is facing is the anatomical and functional demarcation of the pathologic network. As with any therapy its efficacy depends on selecting suitable candidates, which implies a multidisciplinary workup. The course will focus on the underlying molecular mechanisms as well as the (lack of) rationale behind the treatment options. Students will receive experience with the multidisciplinary workup and the molecular assays that are currently explored to characterize these disorders.

Literature
Journal articles and book chapters.

Instructional Approach
Lectures, group meetings, practical sessions.

Form of Assessment
Written examination and evaluation of practical performance.

PSY4317 418FN Neuroimmunology and Inflammation – 4 credits

Coordinator: Mario Losen, Psychiatry and Neuropsychology (FHML), Phone 38 81042, 50 Universiteitssingel, Room 1.114, E-mail: m.losen@np.unimaas.nl

Objective(s)
To become acquainted with the interaction of the Immune system with the central nervous system in health and disease.

Key words
Innate immune system; macrophages and microglia; B cells, T cells and dendritic cells; blood brain barrier (BBB); neurodegeneration.

Description of the Course
Neuroimmunology is the study of interactions between the immune and the nervous systems. Immune mechanisms and inflammatory processes play an important role in maturation and aging during normal life span. Moreover, brain and spinal cord trauma, neurodegenerative brain diseases and autoimmune diseases involve activation of immune mechanisms and inflammation, contributing to disease development. This course explains the function of the immune system in general with a special focus on the immune privileged central nervous system. In particular, the course emphasizes the role of inflammatory cells and proinflammatory molecules in Alzheimer's disease, multiple sclerosis, Parkinson's disease and mood disorders. A special focus will be on the molecular basis of novel treatment approaches of these diseases and regulation of the inflammatory mediators in neurodegeneration.

Literature
Journal articles and book chapters.

Instructional Approach
Group meetings, invited lectures by clinical and research specialists in neuroimmunology, practical sessions.

Form of Assessment
Written examination and evaluation of practical performance.

PSY4319 419FN Stress, Emotions and Affective Disorders – 4 credits
Coordinator: Daniël van den Hove, Psychiatry and Neuropsychology (FHML),
Phone 38 84120, 50 Universiteitssingel, Room 1.108, E-mail: d.vandenhove@np.unimaas.nl

Objective(s)
Understand the (molecular) biology of stress, emotions and affective disorders. Gain insight into the spatial and functional organization of the brain in relation to affective disorders. To become acquainted with animal models for affective disorders and to learn how data obtained with these models should be translated to the human situation. Learn how to design experiments to study the pathophysiology of affective disorders. Learn how to present data (oral presentation).

Key words
Stress, depression, anxiety, hypothalamo-pituitary-adrenal (HPA) axis, antidepressants.

Description of the Course
Almost everybody knows what it is like to feel nervous or anxious: for instance the

tension one feels before an examination or the way the heart pounds when one is in danger. Stress rouses the mind and body for (re)action so the individual is able to face a threatening situation. If the reaction is appropriate one can cope with the stressor. Yet chronic and/or excessive stress may lead to the development of psychiatric conditions such as depression and anxiety, in which the patient shows inadequate coping associated with a severe disruption of daily life. A major challenge in research on stress and related disorders is to unravel the molecular basis of persistent changes in behaviour that explain the symptoms of mental illness and their (partial) reversal during treatment. This course focuses on the psychobiology of stress, emotions and associated disorders such as depression and anxiety. It will cover various neuroscientific areas like molecular neurobiology, but also functional neuroanatomy, neurophysiology and neuropsychopharmacology. Major focus will be on the limbic system, the sympathetic nervous system and the hypothalamo-pituitary-adrenal axis as key players of emotional regulation in health and disease. Further, the role of different neurotransmitter systems such as the serotonergic system will be discussed in depth.

Literature
Journal articles and book chapters.

Instructional Approach
Group meetings, lectures, practical sessions.

Form of Assessment
Written examination and evaluation of practical performance.

PSY4318 420FN Gene x Environment Interactions – 4 credits

Coordinator: Gunter Kenis, Psychiatry and Neuropsychology (FHML), Phone 38 84120, 50 Universiteitssingel, Room 1.108, E-mail: g.kenis@np.unimaas.nl

Objective(s)
Understand the nature of genetic variation, and its relation to psychiatric disorders. Understand the concept of linkage analysis, association studies, endophenotypes and gene-environment interaction. Know the neurobiological basis of emotion processing, motivation and several cognitive processes, and its moderation by polymorphisms. Acquire knowledge and skills of the laboratory analysis of genetic variations. Being able to statistically analyze and interpret data from genetic studies. To contemplate on ethic issues regarding genetic studies in psychological and neurological diseases.

Key words
Genetics, polymorphism, endophenotypes, epigenetics, emotion, cognition, gene expression.

Description of the Course
Although 'genes for psychiatric disorders' do not exist, it has become clear that

variations in many genes are predisposing factors for mental Illness. These variations or polymorphisms often interact with subtle environmental insults to alter a person's vulnerability to develop psychiatric and neurological diseases. Imaging studies have revealed the neurobiological substrates for these disorders and show how their activity is moderated by genetic variations. From DNA to neurological networks, this course will focus on the mechanisms that underlie the influence of genetic polymorphisms on different facets of human behavior, including emotional processing and cognitive functioning. In addition, the interaction between genes and environment on neuronal processes relevant for the pathophysiology of schizophrenia, major depression and addiction will be studied. In training sessions, the student will gain insight into the design and implementation of genetic studies, including polymorphism determinations and statistics.

Literature
Journal articles and book chapter.

Instructional Approach
Group meetings, lectures, practical sessions.

Form of Assessment
Presentation, written examination and evaluation of practical performance.

PSY5311 511FN **Electrophysiology: From Single Cell Activity to 'Cognitive' Markers – 4 credits**

Coordinator: Anke Sambeth, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81757, 40 Universiteitssingel East, Room 2.741,
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Objective(s)
To learn how electrical signals develop in the brain. To obtain knowledge on the way we measure these signals. To learn what they mean in terms of behaviour, arousal, and cognition. To improve your presentation and writing skills.

Key words
Signal transduction, neurophysiology, electrophysiology, frequency domain, event-related potentials.

Description of the Course
Our brain is busy all the time, whether we are awake or asleep and thousands of neurons are communicating with each other. Neurotransmitters and electrical currents are conveying the information from one cell to another. This course is an introduction into the field of brain electricity. There will be literature discussions on how currents develop (i.e., role of molecules, ion channels, or membrane), how these currents are perceived in the EEG, what the differences are in measurements of various

species, and what these currents mean in terms of e.g., event-related potentials or (de)synchronization measures. Furthermore, we will talk about the practical issues when doing EEG recordings. Next to the presentation of pictures and short videos on how measurements in animals are done, students acquire hands-on experience with EEG recordings in humans.

Literature

For the general information, several recent book chapters and reviews will be used. Furthermore, several in-depth articles about specific topics in electrophysiology will be used to evaluate the current standard procedures used.

Instructional Approach
Lectures, group meetings and practical sessions.

Form of Assessment
Written assignment, presentation, and evaluation of practical performance.

PSY5312 512FN In Vitro and in Vivo Neuroscience: Models and Tests – 4 credits

Coordinator: Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) / Psychiatry and Neuropsychology (FHML), Phone 38 81168,
50 Universiteitssingel, Room 1.110, E-mail: jos.prickaerts@maastrichtuniversity.nl

Objective(s)
Get an overview of the possibilities in research to answer a scientific question, but learn which tools/techniques/approaches are most appropriate to select. How to link animal research to human research and vice versa: translational approaches.

Key words
Test, model, in vitro, in vivo, animal, human, translational.

Description of the Course
Neuroscience research involves the use of a wide variety of techniques and tools for investigations at the molecular level up to the behavioural level and even further as environmental factors also have to be taken into consideration. How does a neuroscientist plan his/her experiments to test the hypothesis? Which techniques and tools are necessary and what should be done first? Is it best always to start in vitro or should one start more upstream with in vivo experiments? Why work with animals? Eventually all collected data have to be analyzed, integrated and interpreted. What is important and what of lesser importance? Examples are given from the field of cognitive and affective disorders. For example, what does long-term potentiation tell you about cognitive functioning in an Alzheimer patient? Or what does a cell culture tell you about depression?

Literature
Journal articles and book chapters.

Instructional Approach
Group meetings, lectures, demonstrations of different neuroscience experiments.

Form of Assessment
Presentation, written assignment and evaluation of practical performance.

3.4 Skills trainings

PSY4221 521FN EEG and ERP – 2 credits
Coordinator: Fren Smulders, Cognitive Neuroscience (FPN), Phone 38 81909,
40 Universiteitssingel East, Room 4.777a, E-mail: f.smulders@maastrichtuniversity.nl

Objective(s)
The aim of this training is to give the students hands-on experience with the experimental design, data acquisition and analysis of EEG and ERP experiments.

Key words
Electroencephalography (EEG), Event-related potentials (ERP), electrophysiology, measurement, analysis of brain potentials.

Description of the Course
EEG and ERP offer a combination of supremely precise measurement of the time course of brain processes, low cost, non-invasiveness, and widespread availability. For this reason they make a unique contribution to cognitive neuroscience. Scientific interest in them is still growing, and results have been increasingly integrated with other imaging techniques during the last decades. A lecture and basic literature will introduce students to some background of EEG and ERP research, the terminology of the field, and the possibilities and limitations. A first topic is how to set up an experimental paradigm that is suitable for EEG and ERP measurement. Then students shall study practical measurement issues, such as electrode placement, and the types of artifacts that one may expect. Finally, there is the interpretation of the resulting data. Successful measurement requires an understanding of some basic signal analysis techniques that are specific for EEG and ERP, such as artifact management, spectral analysis, filtering, ERP averaging, time-frequency analysis etc. After that, there will be a hands-on training in smaller groups in running an ERP experiment, including electrode application, minimizing artifacts, and hygiene and safety in the lab. A simple experimental paradigm will be used that gives interesting and reliable results. Data processing will include various EEG analyses that are commonly used, e.g., analyses in the time and frequency domain.

Literature
Journal articles and handbooks.

Instructional Approach
Tutorial group meetings with student presentations, lecture, a lab session, and analysis sessions.

Form of Assessment
A paper and a practical report.

PSY5222 522FN Data Management – 1 credit

Coordinator: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81940, 40 Universiteitssingel East, Room 2.743,
E-mail: e.theunissen@maastrichtuniversity.nl

Objective(s)
To acquire basis skills in data management using the software package Excel.

Key words
Data management, data analysis, spreadsheets, graphs, Excel.

Description of the Course
This programme Exel has many features that can be very helpful to overcome time-consuming formatting of databases. First, an introduction of the basic features of Excel will be presented. Being familiar with these basic aspects is necessary to understand copying of values and formulas (relative or absolute). Also, Excel enables students to make various types of graphs, which can be very helpful for quickly visualizing data. A fourth aspect that will be dealt with is pivot tables, a very helpful tool to organize data in any manner students find most suitable for further data handling. A final option that will be dealt with is the use of macros. These are especially helpful when repetitious changes in layout or recalculations have to be made.

Instructional Approach
Group meetings with demonstrations based on student data. Students may provide the instructor with data to be used as examples.

Form of Assessment
Written assignment.

3.5 M&T workshops

PSY4331 431FN Molecular Genetics – 1 credit

Coordinator: Gunter Kenis, Psychiatry and Neuropsychology (FHML), Phone 38 84120, 50 Universiteitssingel, Room 1.108, E-mail: g.kenis@np.unimaas.nl

Objective(s)
To get insight how genetic alterations cause vulnerability for psychiatric and neurological disorders.

Key words
DNA, epigenetics, polymorphism, mutation.

Description of the Course
Currently, the role of genes in causing vulnerability for psychiatric and neurological disorders is prominent. This workshop focuses on which genetic alterations play a role in this respect. Epigenetic phenomena such as DNA methylation and histone deacetylation will be discussed. In addition more traditional gene alteration will be discussed, including single nucleotide polymorphisms, insertion/deletion, repeats, copy/insert variations and frame shift mutations. Students will gain insight, by use of theoretical models, into how these DNA alterations can occur and affect DNA transcription.

Instructional Approach
Lectures and discussion groups.

Form of Assessment
Written assignment.

PSY4332 432FN Surgery for Intractable Movement and Psychiatric Disorders – 1 credit

Coordinator: Yasin Temel, Neurosurgery / Psychiatry and Neuropsychology (FHML), Phone 38 81168, 50 Universiteitssingel, Room 1.110, E-mail: y.temel@np.unimaas.nl

Objective(s)
To gain knowledge about neurosurgical techniques for movement and psychiatric disorders.

Key words
Brain lesions, deep brain stimulation, drugs, electrophysiology.

Description of the Course
The aim of this course is to guide the participants through the first key steps of neuroscience experiments related to movement and psychiatric disorders. The participants will receive relevant knowledge via lectures and will have the opportunity to apply this in practice via a hands-on setup. General neurosurgical techniques will be shown that are used to selectively lesion brain areas, to chronically infuse drugs to brain areas, to deep brain stimulate and electrophysiologically record from brain areas. Also, behavioural tests used to study the functional consequences of the neurosurgical interventions will be demonstrated and discussed.

Instructional Approach
Discussion groups and lectures.

Form of Assessment
Written assignment.

PSY4337 433FN Commercializing Science and Technology – 2 credits
Coordinator: Wynand Bodewes, Maastricht Centre for Entrepreneurship,
Phone 38 83980, 49 Tongersestraat, Room 13.1.013,
E-mail: w.bodewes@maastrichtuniversity.nl

Objective(s)
To gain knowledge and experience about commercialization of research.

Key words
Commercialization, entrepreneurship, patents, licensing.

Description of the Course
This workshop focuses on the process of turning science into products and products into businesses. University labs and corporate Research and Development departments increasingly rely on professionals that help bridging science production (conference presentations, scientific publications, and patents) to value creation (revenues, funding for scientific and applied research). Thus, understanding the bridging of science to business is essential. Within this context insight is provided in technology transfer and licensing as well as in the dynamics of science production and deployment. These aspects are of increasing importance to academic researchers as universities seek to enlarge their research budgets by selling or licensing its intellectual property. Additional points of attentions are legal, fiscal and governance issues involved.

Instructional Approach
Discussion groups and lectures.

Form of Assessment
Written assignment and exam.

PSY4109 409RM Research Ethics – 1 credit

Coordinator: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81940, 40 Universiteitssingel East, Room 2.743,
E-mail: e.theunissen@maastrichtuniversity.nl

Objective(s)
To critically examine ethical issues and to learn about ethical and legal regulations in research.

Key words
Ethics, legal, guidelines.

Description of the Course
Students will learn to think critically about ethical dilemmas that psychologists encounter when exercising their profession. This workshop will discuss legal and ethical conflicts that are involved in psychological research and clinical practice. Students will be introduced to the ethical and legal rules and boundaries in human research, and to the organizations and institutes supervising the application of these rules.

Psychologists always need to make sure that they carry out their work in an ethical and legally sound way. However, there is often a conflict of interests of the involved parties. In all circumstances, however, it is the psychologist's primary task to secure the patients/participants welfare and to keep risks at a minimum. Therefore psychologists should know which ethical aspects are of importance and which laws and rules need to be applied and also which institutions supervise on the application of these rules. In addition, these aspects should be taken into consideration when writing and submitting a research proposal to an ethical commission.
The following topics will be discussed:
- Examples of ethical and legal failings
- Necessity of ethical and legal rules
- Different guidelines: declaration of Helsinki, guidelines for Good Clinical Practice, etc.
- Working with participants/patients: rights and duties, confidentiality, data processing and storage, etc.
- Applying ethical and legal rules in e.g., protocol, case report form, informed consent, etc.
- Ethical and legal reviews.

Literature
Links to relevant literature on EleUM.

Instructional Approach
Lectures and discussion groups.

Form of Assessment
Presentation.

PSY4333 434FN Epidemiology – 1 credit

Coordinator: Marcus Huibers, Clinical Psychological Science (FPN), Phone 38 81487, 40 Universiteitssingel East, Room 5.750, E-mail: m.huibers@maastrichtuniversity.nl

Objective(s)
To get acquainted with the principles of epidemiological research.

Key words
Epidemiology, methodology, research designs.

Description of the Course
Epidemiology often is referred to as "quantitative medicine". In general, epidemiology deals with methodology issues in the field of health research, including mental health. Students in this workshop will be introduced to the principles of epidemiological research. Topics that are covered in the workshop include: frequency measures, association measures, sources of bias, validity issues, cohort studies, clinical trials, and systematic reviews. The theory of epidemiology will be studied and applied in interactive workshop sessions.

Literature
Required reading will consist of several chapters from a clinical epidemiology textbook and additional research papers combined in an e-reader. In addition to the workshops sessions, students are expected to spend 5 hours a week on reading and homework assignments.

Instructional Approach
Format of the workshop is a series of four 2-hour sessions and a fifth presentation session. Starting each session, the lecturer will give a 30-minute presentation of the topics covered in that session, followed by a 30-minute discussion of these topics. The second hour will be spent on group assignments under supervision of the lecturer.

Form of Assessment
Group assignment: During the entire workshop, students will work on a research proposal in groups of three. Students will prepare the proposal during the sessions; the remainder of the work is part of the homework assignments. The groups will give a 10-minute presentation of their proposals in a final session. Members from the other groups will act as the jury. Based on the presentations and feedback, the lecturer will give the final assessment (fail or pass).

PSY4334 435FN Imaging – 2 credits

Coordinator: Vincent van de Ven, Cognitive Neuroscience (FPN), Phone 38 84510, 40 Universiteitssingel East, Room 4.761, E-mail: v.vandeven@maastrichtuniversity.nl

Objective(s)
Introducing the basic principles of the most common imaging methods, and critical assessment of these methods in studying human brain functions and dysfunctions.

Key words
Magnetic resonance imaging (MRI), functional MRI, structural MRI, positron emission tomography (PET), neuroimaging.

Description of the Course
This workshop is intended to provide:
- introductory knowledge of the basic principles underlying the most common imaging methods;
- appreciation of potentialities and limitations of various neuroimaging methods in studying human brain functions and dysfunctions.

The investigation of human brain anatomy and functions using a range of imaging methods represents the most influential development in Psychology in the last years. In this workshop, essential facts about contemporary major structural and brain mapping techniques, including Positron Emission Tomography (PET), structural and functional Magnetic Resonance Imaging (fMRI) will be reviewed. The focus will be on the strengths and weaknesses of each of these methods and on the description of relevant applications in the normal and pathological brain. These topics will be further investigated through lectures and paper discussions.

Literature
Selected papers which will be made available prior to the start of the course.

Instructional Approach
Lectures, paper discussion, demonstration visit to the MRI scanner.

Form of Assessment
Paper assignment: Preparing a research proposal.

PSY4335 436FN Psychopharmacology - 1 credit
Coordinator: Wim Riedel, Neuropsychology and Psychopharmacology (FPN),
Phone 38 84322, 40 Universiteitssingel East, Room 2.777a,
E-mail: w.riedel@maastrichtuniversity.nl

Objective(s)
Getting familiarized with current research topics in Psychopharmacology; learning to know the drivers and applications; i.e. neuropsychiatric disease understanding and how this relates to development of new drugs.

Key words
Pharmacology, genetics, physiological psychology, experimental neuropsychology, biological psychiatry, drug development, biomarkers.

Description of the Course
The workshop aims to present Psychopharmacology in a broad sense. The multi-disciplinary nature of psychopharmacology encompasses pharmacology, molecular biology, genetics, physiological psychology, experimental, clinical and cognitive neuropsychology and biological psychiatry. The emphasis will be on understanding drug development, drug action, drug research, animal and human pharmacological models of clinical disorders, experimental / clinical trial design and the development of biomarkers, real measures and surrogate measures of drug efficacy.
The course will focus on major areas in Psychopharmacology such as Addiction, Depression, Anxiety, Psychosis and Cognition. These areas will be illuminated form both the perspectives of basic neuroscience including animal subjects as well as experimental and clinical human psychopharmacology.

Instructional Approach
Each half-day the programme will consist of a sequence of three elements:
- Key note Lectures by internationally renowned speakers in the morning;
- presentations of recent research by PhD students or junior researchers;
- forum report by students about the poster-presentations.

The workshop offers plenty of opportunity for the Master's student to interact with PhD students, junior and senior staff and the invited guest speakers.

Form of Assessment
Short presentation in the forum discussion.

PSY5101 501RM Advanced Academic Writing – 2 credits

Coordinator: Caroline van Heugten, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 84091, 12 Dr. Tanslaan, Room 4.E3.017, E-mail: c.vanheugten@maastrichuniversity.nl

Objective(s)
The goals of the course are to familiarize the Research Master's students with the academic writing process involving research protocols, grant proposals, scientific papers and posters. A variety of academic writing skills will be practiced.

Key words
Writing skills, research protocol, author guidelines.

Description of the Course
During this course, students will be familiarized with the different phases of writing

scientific products, such as research protocols, scientific publications, grant proposals and scientific posters. In advance of their upcoming career as a scientist and in the nearby future their masters thesis, they will learn to define and crystallize a research question based on its feasibility and scientific relevance; to prepare and structure their arguments and to plan the different parts of the paper; to think about suitable designs and research methods for data acquisition and analysis, and, finally, to learn how to walk through the writing process starting from draft to the final version. The student will get acquainted with the competitive nature of academic writing in an exercise environment. This all will be accomplished by competence-based learning in which they have to integrate factual knowledge (from the literature) into skill-based practice (by exercise).

Instructional Approach
A combination of lectures, take home writing assignments and take home review assignments, a workgroup meeting with poster presentations.

Form of Assessment
A positive evaluation of this workshop is based on:
- attendance at the lectures;
- fulfilling all take-home writing and review assignments;
- writing a final research proposal of sufficient quality (introduction/theoretical background and method/workplan); feedback about the proposal will be given on an individual level;
- presenting a poster.

3.6 Research internship and Master's thesis

PSY5102 502RM Research internship and PSY5103 Master's thesis – 50 credits
Coordinator: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 82181, 40 Universiteitssingel East, Room 2.755,
E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
Conduct an empirical research project under supervision resulting in a thesis.

Key words
Internship, research, Master's thesis.

Description of the internship
The second part of the 2nd year of the Research Master's programme is devoted to arranging and conducting a research internship. As a result of the many international research contacts our faculty members have established, a substantial number of students will conduct their research internship abroad. Students finalize the Master's programme by writing a thesis on their internship.

The internship can be done at Maastricht University or at external research institutes. In all cases, two assessors will evaluate the research proposal and Master's thesis. At least one assessor has to be a member of the Faculty of Psychology and Neuroscience (FPN) or the Faculty of Health, Medicine and Life Sciences (FHML). The other assessor might be a (senior) researcher at, for example, the institute where the data are collected.
A detailed guide on research internships and Master's thesis can be found on EleUM > Students Research Master Faculty of Psychology and Neuroscience > internships.

Form of Assessment
Credits will be assigned on the basis of the proposal and research activities (36 credits, pass/fail assessment) as well as the thesis (14 credits, graded assessment).

For more information about research internships contact the general coordinator or go directly to the internship contact of the specific specialization programme:

General Coordinator Internships: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 82181, 40 Universiteitssingel East, Room 2.755, E-mail: bart.scholtissen@maastrichtuniversity.nl

Fundamental Neuroscience: Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone (043) 38 81168, 50 Universiteitssingel, Room 1.110, E-mail: jos.prickaerts@maastrichtuniversity.nl

3.7 Schedule Fundamental Neuroscience

Period	YEAR 1
Period 0, 1 week 31th August - 4th September 2009	Introduction Week
Period 1, 7 weeks 7th September – 23th October 2009	**PSY4105 405RM Interdisciplinary Perspectives** (total of 3 credits)
	Core Courses: PSY4311 411FN Introduction to Molecular and Biochemical Techniques (4 credits), PSY4312 412FN Introduction to Psychology (4 credits), PSY4315 413FN Biopsychological Neuroscience (4 credits) & PSY4106 406RM Advanced Statistics I (total of 2 credits)
	PSY4100 404RM Colloquia (total of 5 credits)
Period 2, 6 weeks 26th October – 11th December 2009	**PSY4105 405RM Interdisciplinary Perspectives**
	Core courses: PSY4313 414FN Neuroanatomy (4 credits), PSY4314 415FN Neurodegeneration (total of 4 credits) & PSY4106 406RM Advanced Statistics I
	PSY4100 404RM Colloquia
Christmas break	

Period 3, 4 weeks 4th January – 29th January 2010	**Core course:** PSY4336 416FN Neuroplasticy and Pain (4 credits) & PSY4106 406RM Advanced Statistics I
	Workshop: PSY4331 431FN Molecular Genetics (1 credit)
	PSY4100 404RM Colloquia
Period 4, 4 weeks 1st February – 5th March 2010	**Core course:** PSY4316 417FN Neurological Disorders (4 credits) & PSY4107 407RM Advanced Statistics II (total of 3 credits)
	Workshop: PSY4332 432FN Surgery for Intractable Movement and Psychiatric Disorders (1 credit)
	PSY4100 404RM Colloquia
Period 5, 4 weeks 8th March – 2nd April 2010	**Core course:** PSY4317 418CN Neuroimmunology and Inflammation (4 credits) & PSY4107 407RM Advanced Statistics II
	Workshop: PSY4337 433FN Commercializing Science and Technology (total of 2 credits) & PSY4109 409RM Research Ethics (1 credit)
	PSY4100 404RM Colloquia
Period 6, 5 weeks 12th April – 12th May 2010	**Core course:** PSY4319 419FN Stress, Emotions and Affective Disorders (4 credits)
	Workshop: PSY4337 433FN Commercializing Science and Technology & PSY4333 434FN Epidemiology (1 credit)
	PSY4100 404RM Colloquia
Period 7, 5 weeks 17th May – 18th June 2010	**Core course:** PSY4318 420FN Gene X Environment Interactions (4 credits)
	Workshop: PSY4334 435FN Imaging (2 credits) & PSY4335 436FN Psychopharmacology (1 credit)
	PSY4100 404RM Colloquia

Period	**YEAR 2**
Period 1, 4 weeks 31th August - 25th September 2009	**Core course:** PSY5311 511FN Electrophysiology: From Single Cell Activity to 'Cognitive' Markers (4 credits)
	Workshop: PSY5101 501RM Advanced Academic Writing (total of 2 credits)
	Skill training: PSY4221 521FN EEG and ERP (total of 2 credits)
Period 2, 4 weeks 28th September - 23th October 2009	**Core course:** PSY5312 512FN In Vitro and in Vivo Neuroscience: Models and Tests (4 credits)
	Workshop: PSY5101 501RM Advanced Academic Writing
	Skill training: PSY4221 521FN EEG and ERP & PSY5222 522FN Data Management (1 credit)
32 weeks	**PSY5102 502RM Research internship & PSY5103 Master's thesis** (50 credits)

4

Specialization Neuropsychology (NP)

The specialization in Neuropsychology focuses on the relationship between brain and behaviour. In this perspective, behaviour is a broadly defined term and includes cognitive functions (e.g., memory, language, perception, planning, and psychomotor functions) as well as affective functions. These so-called 'brain-behaviour' relationships are addressed on a continuum ranging from 'normal' to 'deviant' in children, adolescents and patient populations. Neurological (e.g., Parkinson disease) and psychiatric disorders (e.g., ADHD, schizophrenia, dementia) will be studied thoroughly. In addition, in the context of psychopharmacology, biological mechanisms are studied which pertain to neurotransmitters, hormones, and drugs that act upon cognitive function and behaviour. Central is the relation between manipulating brain neurochemistry by means of psychoactive substances and cognitive function, in animal and human models. An integrated programme will be presented that includes most aspects of basic and applied neuroscience. Students will have the opportunity to work in a multidisciplinary team consisting of psychologists, biologists and psychiatrists.

Neuropsychology Coordinator:

Rob Markus, Neuropsychology and Psychopharmacology (FPN), Phone (043) 38 82 474, 40 Universiteitssingel East, Room 2.777a, E-mail: r.markus@maastrichtuniversity.nl

4.1 Interdisciplinary Perspectives

PSY4105 405RM Interdisciplinary Perspectives –3 credits

Coordinators: Nancy Nicolson, Psychiatry and Neuropsychology (FHML), Phone 36 88684, Vijverdal, Room SN2.068, E-mail: n.nicolson@sp.unimaas.nl; Rob Markus, Neuropsychology and Psychopharmacology (FPN), Phone 38 82 474, 40 Universiteitssingel East, Room 2.777a, E-mail: r.markus@maastrichtuniversity.nl; Milene Bonte, Cognitive Neuroscience (FPN), Phone 38 84036, 40 Universiteitssingel East, Room 4.743, E-mail: m.bonte@maastrichtuniversity.nl; Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 81168, 50 Universiteitssingel, Room 1.110, E-mail: jos.prickaerts@maastrichtuniversity.nl

Objective(s)

To understand and integrate research approaches from distinct but related disciplines.

Key words

Memory, developmental psychology.

Description of the Course

This lecture course, attended by all first-year students, is designed to highlight selected research topics from the perspectives of cognitive neuroscience, fundamental neuroscience, neuropsychology and psychopathology. The aim is to illustrate how the distinct but inter-related approaches to questions in the field of brain and behaviour

can enrich our understanding of underlying mechanisms as well as cognitive, emotional and behavioural outcomes in health and disorder.

Instructional Approach
A series of four lectures for each of two broad themes. Faculty members from each of the four specializations will present lectures in successive weeks.
Required readings, assigned by each lecturer, will be made available prior to the first meeting of a new theme.

Form of Assessment
Following each series of four lectures, an exam will be given, covering material from all of the assigned readings and lectures for that theme. A final pass/fail score is based on the average grade obtained on the two exams.

4.2 Colloquia

PSY4100 404 RM Colloquia – 5 credits
Coordinators: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 81940, 40 Universiteitssingel East, Room 2.743, E-mail: E.Theunissen@maastrichtuniversity.nl;
Joel Reithler, Cognitive Neuroscience (FPN), Phone 38 81896, 40 Universiteitssingel East, Room 4.761, E-mail: J.Reithler@maastrichtuniversity.nl;
Anne Roefs, Clinical Psychological Science (FPN), Phone 38 82191, 40 Universiteitssingel East, Room 3.747, E-mail: A.Roefs@maastrichtuniversity.nl;
Harry Steinbusch, Psychiatry and Neuropsychology (FHML), Phone 38 81021, 50 Universiteitssingel, Room 1.112, E-mail: h.steinbusch@np.unimaas.nl

Objective(s)
The purpose of the colloquia is to foster interdisciplinary knowledge and interaction among students from different specializations and with varying interests. In addition, the assignments provide students with valuable practice in writing research proposals and in peer reviewing - two extremely important skills for a young scientist.

Key words
Interdisciplinary knowledge, research proposal, peer review.

Description of the Course
Weekly colloquia are presented by UM faculty and by visiting guest lecturers. The colloquia focus in depth on one of a wide range of topics, with issues transcending the courses and even the specializations. Each colloquium will consist of a lecture followed by active discussion, prepared and chaired by the lecturer (for guest lecturers, the UM host may fill this role). Each specialization will organize 7 or more colloquia so that a total of approximately 24 colloquia will be offered each year.

Literature
Most colloquium speakers will provide background readings, which will be made available on EleUM.

Instructional Approach
Students will attend at least 15 colloquia, and will choose one topic of these colloquia to base their research proposal on. They will also provide peer reviews on two of their fellow students' research proposals.

Form of Assessment
Students are evaluated (pass/fail) on the basis of attendance, a written research proposal, and submission of two peer reviews.

4.3 Core courses

PSY4407 441NP Brain Damage – 4 credits
Coordinator: Martin van Boxtel, Psychiatry and Neuropsychology (FHML),
Phone 38 81028, Dr. Tanslaan 12, Room 4.E3.017, E-mail: m.vanboxtel@np.unimaas.nl

Objective(s)
After completion of the course the students will have a broad overview of functional brain anatomy (including lobar anatomy and cerebral vascularization), the neurophysiology of brain repair, and the neurological diseases (e.g. brain trauma, stroke, and epilepsy) that are relevant for Neuropsychology, both as a clinical and a research discipline. The student will become familiar with the fundamental processes involved in functional brain plasticity. This knowledge is essential to understand the principles of neuropsychological rehabilitation in order to support or even improve residual function after brain damage and to ameliorate the life quality of neurological patients.

Key words
Brain damage, neuropsychology, cognitive function, neurology, cognitive assessment, neurology.

Description of the Course
Students are introduced to the fields of Behavioural Neurology and Neuropsychology: what do pathological conditions in brain structure and function tell us about the relationship between brain and behaviour? Much of what we know about cognitive processes and affective functioning has been learned from close observation of patients with damage to the central nervous system. This course reviews mechanisms of the relationship between brain and behaviour that are the basis of neuropsychological dysfunctions in persons who suffer from brain damage. Students acquire knowledge about the causes and neurobiological effects of brain lesions, and get acquainted with the 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 necessary to identify such deficits, including disorders of memory, praxis, language, visual spatial abilities and executive function.

Literature
Journal articles available via EleUM. Selected readings from neuropsychological and neurological handbooks.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written exam with open questions.

PSY4408 442NP Behavioural Disorders – 4 credits

Coordinator: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 82181, 40 Universiteitssingel East, Room 2.755,
E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
To increase knowledge about the behavioural manifestations of neurological and neuropsychiatric disorders.

Key words
Behavioural disorders, neuropsychiatry, neurology, mechanisms.

Description of the Course
This course is intended to impart knowledge about the cognitive dysfunctions that accompany severe neuropsychiatric and neurological disorders and to provide insight into the biological mechanisms and intervention possibilities for these disorders. The course is concerned with the changes in psychological functioning that occur in connection with a number of frequently occurring neurological disorders. The intention is to gain insight into the characteristic manifestations of behavioural problems and cognitive functional disturbances along with the brain and behavioural mechanisms that lie at the foundation of these. The emphasis in this course is on the problems associated with neuropsychiatric phenomena such as schizophrenia, compulsive symptoms, ADHD, apathy and autism. The neuropsychiatric problems associated with a number of the neurological phenomena important for psychologists will also be considered. Attention will be paid to the psychological problems associated with cerebral disturbances and light brain trauma. With respect to the mechanisms that lie at the base of behavioural and cognitive disorders, both the relevant biological and psychological factors will be covered. Also, neurodevelopmental aspects of behavioural

disorders will be discussed. Finally, the principle of vulnerability, protective/risk factors and psychopharmacology in the aetiology of behavioural disorders will be touched upon.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written exam with open questions.

PSY4409 443NP Arousal and Attention – 4 credits

Coordinator: Annemiek Vermeeren, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81952, 40 Universiteitssingel East, Room 2.738,
E-mail: a.vermeeren@maastrichtuniversity.nl

Objective(s)
To familiarize students with normal and abnormal changes in arousal and attention, with an emphasis on the role of neurotransmitters and the effects of stimulating and sedating drugs.

Key words
Inverted U model; alertness; sustained attention; brainstem arousal systems; sleep-wake regulation; stimulating and sedating drugs.

Description of the Course
This course familiarizes students with key concepts and controversies in the study of arousal and attention, with an emphasis on the role of neurotransmitters and the effects of stimulating and sedating drugs. Several psychological and psychiatric disorders are associated with a lack of energy or a state of hyperarousal, e.g. insomnia and ADHD. Moreover arousal and alertness can vary between and within days, depending for example on the amount of sleep, time of day, or use of drugs (e.g. caffeine, methylphenidate, and sleeping pills). Such variations in arousal and alertness can affect human cognitive functioning, in particular attention. The nature and mechanisms underlying the relation between arousal, attention and performance has been the subject of extensive research in psychology. In addition to a critical discussion of the classic Arousal Theory, this course will review current knowledge on subcortical arousal systems, attentional networks and the neurotransmitters involved. Throughout the course psychopharmacological studies will be presented that illustrate the role of different neurotransmitters in arousal and attention.
The following issues will be discussed: psychophysiological correlates of arousal; unidimensional Arousal Theory (inverted U model, Yerkes Dodson law); multi-

dimensional models; Posner's attentional networks (alerting, orienting, and executive attention); intrinsic alertness, vigilance and sustained attention; underlying neurobiological mechanisms of attention; ascending reticular activating system (ARAS); brainstem and hypothalamic systems regulating sleep and waking; the role of noradrenaline, dopamine and acetylcholine in alertness and attention; the interaction of noradrenaline, serotonin, acetylcholine, histamine, adenosine, orexin and GABA in sleep-wake regulation; disorders such as insomnia and ADHD; some sedative and stimulating drugs, such as sleeping pills and caffeine.

Literature
Journal articles and book chapters via EleUM.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written exam with open questions.

PSY4410 444NP Cognitive Aging – 4 credits

Coordinator: Pascal van Gerven, Neuropsychology and Psychopharmacology (FPN),
Phone 38 84512, 40 Universiteitssingel East, Room 2.742,
E-mail: p.vangerven@maastrichtuniversity.nl

Objective(s)
To acquire a broad knowledge of current issues in cognitive aging research.

Key words
Cognitive, neural and physical aging, dementias.

Description of the Course
This course covers a broad range of topics in the field of cognitive aging. A thorough understanding of normal cognitive aging is considered essential before issues in abnormal aging can be addressed. Important questions are: What is cognitive aging? What neurobiological and cognitive mechanisms determine whether a person ages pathologically, normally, or successfully? How can this aging process be influenced? Students will critically reflect on influential theories, state-of-the-art research, established research methods, and clinical interventions to address these questions. Themes will be physical (somatic) aging, neural aging, cognitive aging, pathological aging (mild cognitive impairment, Parkinson's disease, Alzheimer's disease, and other types of dementia), intervention strategies, and methodological issues in aging research.

Literature
Journal articles.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written exam with open questions.

PSY4411 445NP Biopsychology – 3 credits

Coordinator: Anke Sambeth, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81757, 40 Universiteitssingel East, Room 2.741,
E-mail: anke.sambeth@maastrichtuniversity.nl

Objective(s)
To learn about physiological processing in the brain (e.g., action potentials, second messenger systems, neurotransmitters). To link these fundamental biological mechanisms to behaviour and cognition (e.g., motivation, stress related memory); To improve presentation and writing skills.

Key words
Action potentials, second messengers, neurotransmitters, hormones, stress related cognition, motivation.

Description of the Course
This course provides an in depth description of biopsychological concepts which have been presented in the bachelor programme in the first and third year. It will cover elements from functional neuroanatomy, neurophysiology and psychopharmacology, as applied to brain and behaviour research. Major emphasis will be on the macro- and microanatomy of the brain, neurochemical and neurobiological mechanisms related to neurotransmission, hormones and drug action. With respect to 'function', an elaboration will be given of processes underlying, e.g., sexual behaviour, motivated behaviour, and cognitive processes.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings.

Form of Assessment
Written assignment, presentation, and active participation.

PSY4412 446NP Brain, Learning, and Memory – 3 credits

Coordinator: Arjan Blokland, Neuropsychology and Psychopharmacology (FPN),
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E-mail: a.blokland@maastrichtuniversity.nl

Objective(s)
To gain more insight into the different aspects of learning and memory and the neurobiological mechanisms underlying learning and memory.

Key words
Prefrontal cortex, hippocampus, thalamus, striatum, limbic system, neurotransmitters, long-term potentiation, plasticity, working memory, short-term memory, long-term memory, acquisition, consolidation, retrieval.

Description of the Course
There has been a rapid increase in our understanding of the basic mechanisms underlying the consolidation of new information and its later 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 both in terms of biology and cognition. Also, the influences of drugs and circumstances that lead to decreased efficiency of information processing are discussed in depth.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings and introductory lecture.

Form of Assessment
Written assignment and presentation.

PSY4413 447NP Executive Functions and Control of Action – 3 credits

Coordinator: Eric Vuurman, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81046, 40 Universiteitssingel East, Room 2.747,
E-mail: e.vuurman@maastrichtuniversity.nl

Objective(s)
To study the relationships between cognitive control, observed behaviour and brain activation.

Key words
Executive functions, motor control, frontal cortex.

Description of the Course
The course presents multidisciplinary information from experimental psychology, neuropsychology, cognitive neuroscience and related disciplines. Various techniques and theoretical models are presented and evaluated, and the neuroscientific basis of the behavioural and cognitive functions is discussed. A key element in our current understanding of behavioural organization is cognitive control. At present, a redefinition of related concepts (such as inhibition, working memory and executive functioning) is taking place, based on insights from cognitive neuroscience. Based on data from imaging studies the behavioural models of cognitive control are restructured. Throughout the course, emphasis will be on mechanisms of attention, working memory, cognitive shifting, preparation for action, sensorimotor integration, behavioural planning, and monitoring. Various experimental approaches are evaluated and discussed in the light of recent literature. Experts in the field of executive and motor control research will present their current work and students will be able to discuss prepared papers and topics with them.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings and lectures.

Form of Assessment
Written assignment, presentation.

PSY4414 448NP Neuropsychiatric Disorders – 3 credits
Coordinator: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN),
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E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
Increasing knowledge about biological mechanisms, behavioural and cognitive aspects, treatment and research of several neuropsychiatric disorders.

Key words
Neuropsychiatric disorders, brain mechanisms.

Description of the Course
The course covers main findings, theories and controversies related to several neuropsychiatric disorders, with an emphasis on brain mechanisms, behavioural and cognitive dysfunction. Both measures used to evaluate biological variables

and techniques relevant for assessment of behavioural and cognitive problems are presented. Disorders at the interface between neuropsychiatry and cognitive/behavioural neurology are discussed (like Parkinson's disease, Huntington's disease, and psychosis). Theories related to dysfunctional brain structures and their relations are presented. Dysfunctions at the level of neurotransmitters are presented, as well as neuroimaging methods (PET, SPECT, fMRI) used to evaluate changes in metabolism. In short, this course deals with all major aspects (basic knowledge, theories, biological mechanisms, cognitive and behavioural implications, treatment, and research) of a number of general neuropsychiatric disorders. Students learn to integrate all the previously mentioned aspects of the disorders in order to increase their general knowledge of neuropsychiatry.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings.

Form of Assessment
Written assignment, presentation.

PSY4415 449NP Neuropsychopharmacology – 3 credits
Coordinator: Jan Ramaekers, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81951, 40 Universiteitssingel East, Room 2.736,
E-mail: j.ramaekers@maastrichtuniversity.nl

Objective(s)
To understand neurochemical mechanisms of drugs and CNS disorders.

Key words
Drug action, psychopharmacology of CNS disorders, behavioral toxicity.

Description of the Course
This course addresses the influence of drugs upon normal functioning and 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 pharmaco-epidemiology, pharmaco-fMRI, experimental designs used in treatment studies, drugs of abuse, and recreational drugs.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings.

Form of Assessment
Written assignment, presentation.

PSY4106 406RM Advanced Statistics I – 2 credits

Coordinator: Nick Broers, Methodology and Statistics (FPN) Phone 38 81929, 5 Universiteitssingel, Room 1.014, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: nick.broers@maastrichtuniversity.nl

Objective(s)
Thorough understanding of commonly used advanced statistical methods like ANOVA and regression, and practical skill in applying these with the SPSS software. Elementary understanding of Structural Equations Modelling (SEM) using the Lisrel software.

Key words
Balanced and unbalanced between-subject ANOVA, ANCOVA, MANOVA, multiple regression, discriminant analysis, structural equations modelling (SEM, Lisrel).

Description of the Course
The course consists of six units. In the first four units, participants will be given an in-depth training in the following standard statistical methods: Factorial ANOVA for between-subject designs, analysis of covariance (ANCOVA), multivariate ANOVA (MANOVA), discriminant analysis, and multiple linear regression. Background knowledge of balanced two way factorial ANOVA and multiple regression will be assumed, and these methods will be briefly reviewed. The following advanced topics will then be covered: unbalanced factorial designs, contrast analysis, interaction, nonlinearity, quadratic effects, dummy coding, centering covariates, different coding schemes, collinearity and residuals checks, data transformation. The distinction between confounders and mediators in regression and ANCOVA is also discussed, forming a bridge from regression to structural equations modelling (SEM). The latter is an advanced multivariate method which is gaining importance in psychology but still requires special software (such as Lisrel, EQS, AMOS, or Mplus). SEM is introduced in two units, starting with causal modelling and mediation analysis in cross-sectional research, and then extending this to longitudinal research and latent variables (factors). Special attention is given to model identifiability, model equivalence, global and local goodness of fit indices, parsimony, model modification and cross-validation. Some concepts from matrix algebra are needed for SEM, and these will be briefly discussed without going into technical detail.

Literature
For each unit we will use the handout of the lecture plus a suitable book chapter or article. Details of these will be provided on EleUM. Fox (1997), Howell (2007), and

Kleinbaum (1998) give a fair impression of the content and level of the first four units. Mandatory literature for the two units on SEM are the papers by Baron and Kenny (1986) and Diamantopoulos (1994).

References

- Baron, R.M. & Kenny, D.A. (1986). *The moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations*. Journal of Personality and Social Psychology, 51, 1173-1182.
- Diamantopoulos, A. (1994). *Modelling with LISREL: A guide for the uninitiated*. Journal of Marketing Management, 10, 105-136.
- Fox, J. (1997). *Applied regression analysis, linear models, and related methods*. Thousand Oaks (CA): Sage.
- Howell, D.C. (2007). *Statistical methods for psychology* (6th ed.). Belmont (CA): Thomson/ Wadsworth;
- Kleinbaum, D.G., Kupper, L.L., Muller, K.E., & Nizam, A. (1998). *Applied regression analysis and other multivariable methods* (3rd ed.). Pacific Grove (CA): Brooks/Cole.

PSY4116 Practical SPSS

Coordinator: Nick Broers, Methodology and Statistics (FPN) Phone 38 81929,
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The practical consists of analysis of real data with SPSS, using the methods discussed in the lectures. There will be assignments on balanced twoway ANOVA, unbalanced twoway ANOVA, ANCOVA, multiple linear regression, MANOVA and discriminant analysis. Attention will be given to comparisons between different methods for analyzing the same data, e.g. ANCOVA and regression.

PSY4118 Practical Lisrel

Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001,
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The practical consists of analysis of real data with Lisrel. The first practical lets the students analyze a cross-sectional study first with multiple regression and then with Lisrel, asking them to compare the two outputs and to look for similarities and differences. The second unit lets them analyze a longitudinal study with Lisrel, asking for a comparison between different models in terms of goodness of fit, parsimony and plausibility.

Each course unit includes a computer practical. The assignment (analysis of real data with SPSS or Lisrel) is discussed in a plenary meeting after the practical. Attendance at practicals and discussion meetings is mandatory (with 100% and 85% attendance rule, respectively).

Instructional Approach
Meetings are arranged into units, consisting of lectures, self tuition, computer exercises, and plenary discussions. There are four units on ANOVA and regression methods, and two units on SEM. Each unit starts with a lecture to explain the purpose of a method and theory and assumptions behind it, and to demonstrate its application to real data. The computer practical then allows students to practice that method themselves and try to interpret the computer output guided by questions in the assignment. The results of the assignment are finally discussed in a plenary meeting.

Form of Assessment
Open book, multiple choice exam consisting of questions resembling the exercises (general theory, some elementary computations, and interpretation of computer output). The exam will consist of 18 three-choice items, 3 items per unit, relating to computer output in appendices.

PSY4107 407RM Advanced Statistics II – 3 credits

Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001, 5 Universiteitssingel, Room 1.023, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: gerard.vbreukelen@maastrichtuniversity.nl

Objective(s)
Thorough understanding of repeated measures ANOVA for within-subject and split-plot (between * within) designs, including factorial designs and covariates in repeated measures ANOVA. Elementary understanding of mixed (= multilevel) regression. Introduction to optimal design and sample size calculation.

Key words
Oneway within-subject design, multivariate versus univariate method of analysis, sphericity, epsilon adjustment, two-way within-subject design, split-plot (between*within) design, covariates In repeated measures, mixed regression, marginal models, random intercept, random slope, within-subject covariates, missing data, optimal design, sample size, power.

Description of the Course
The course consists of seven units. The first three units cover the classical repeated measures ANOVA methods for the one- and twoway within-subject design and the split-plot (between* within) design. Special attention is given to the following topics: The choice between multivariate and univariate data format and method of analysis, and the sphericity assumption and epsilon correction for violation of it. The distinction between the within-subjects and between-subjects part of a split-plot ANOVA, and how to obtain both using regression analysis on differences and averages of repeated measures. The surprising consequences of including covariates into repeated measures ANOVA. The choice between different methods of analysis for randomized trials versus for nonrandomized group comparisons. Subsequently, three units are devoted to mixed

(multilevel) linear regression for nested designs and longitudinal studies. This part starts with a unit on so-called marginal models for repeated measures as an alternative to repeated measures ANOVA in case of missing data or within-subject covariates, showing the pros and cons of various models that can be chosen for the correlational structure of repeated measures, such as compound symmetry, AR1 and unstructured. Another unit introduces the random intercept and random slope model for repeated measures as a method for investigating interindividual differences in average and trend in growth curves (longitudinal research) or time series (single trial analysis of lab experiments). The last unit on mixed regression shows the use of such random effects models for the analysis of nested designs, e.g. cluster randomized trials on a sample of at least 10 schools, or general practices or companies (with pupils, patients, or employees nested within organizations). Finally, the topic of optimal design, sample size and power is introduced in a seventh unit.

Literature
For each unit we will use the handout of the lecture plus a suitable book chapter or article. Details of these will be provided on EleUM.
For units 3 (covariates in repeated measures designs) and 6 (nested designs), the following literature will be used:

- Moerbeek, M., Van Breukelen, G.J.P., & Berger, M.P.F. (2003). *A comparison between traditional methods and multilevel regression for the analysis of multicenter intervention studies*. Journal of Clinical Epidemiology, 56, 341-350.
- Van Breukelen, G.J.P. (2006). *ANCOVA versus change from baseline: more power in randomized studies, more bias in nonrandomized studies*. Journal of Clinical Epidemiology, 59, 920-925.
- Van Breukelen, G.J.P., & Van Dijk, K.R.A. (2007). *Use of covariates in randomized controlled trials*. Journal of the International Neuropsychological Society, 13, 903-904.

PSY4117 Practical SPSS
Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001, 5 Universiteitssingel, Room 1.023, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: gerard.vbreukelen@maastrichtuniversity.nl

The practical consists of analysis of real data with SPSS, using the methods discussed in the lectures. There will be assignments on one- and twoway within-subject ANOVA, split-plot ANOVA without and with a covariate, marginal modelling of repeated measures without and with missing data, random effects modelling of repeated measures, random effects modelling of nested designs. Much attention will be given to comparisons between the results of different methods for the same data, such as repeated measures ANOVA versus regression analysis of pretest-posttest control group designs, and repeated measures ANOVA versus mixed regression of longitudinal studies with missing data.

Each course unit includes a computer practical. The assignment (analysis of real data with SPSS) is discussed in a plenary meeting after the practical.

Instructional Approach
Meetings are arranged into units, consisting of lectures, self tuition, computer exercises, and plenary discussions. There are three units on repeated measures ANOVA including covariates, three on mixed regression, and one on optimal design and sample size. Each unit starts with a lecture to explain the purpose of a method and theory and assumptions behind it, and to demonstrate its application to real data. The computer practical then allows students to practice that method themselves and try to interpret the computer output guided by questions in the assignment. The results of the assignment are finally discussed in a plenary meeting.

Form of Assessment
Open book, multiple choice exam consisting of questions resembling the exercises (general theory, some elementary computations, and interpretation of computer output).The exam will consist of multiple choice items, relating to computer output in appendices.

PSY5411 541NP Cognitive Development – 3 credits

Coordinator: Sven Stapert, Neuropsychology and Psychopharmacology (FPN),
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E-mail: s.stapert@maastrichtuniversity.nl

Objective(s)
To examine theoretical and methodological issues in studies of cognitive development from childhood to adolescence.

Key words
Child neuropsychology, inter-individual differences in cognitive development.

Description of the Course
Neuropsychology draws information from many disciplines (whether the focus is on young children or on the elderly), including anatomy, biology, biophysics, aetiology, pharmacology, physiology, physiological psychology, and philosophy. Psychological phenomena are integrated with biological and medical variables. Not only has the clinical setting benefited from knowledge gained by neuropsychologists. In addition, research institutes, education, the business community, and other settings need psychologists that have learned to study behaviour from a brain-behaviour (or cognitive) perspective.

The focus of the present course is on childhood and adolescence, viewed from a clinical and cognitive neuroscientific perspective. The aim is to learn more about scientific views on normal cognitive development as well as disorders in cognitive development. The influence of biological and psychosocial factors is discussed, as well as problems that scientists frequently have to deal with while studying neuropsychology. Finally, clinical expressions of behaviour, affect and cognition, epidemiology, diagnostic procedures, treatment are examples of topics that are discussed during the course.

Literature
Scientific articles and book chapters.

Instructional Approach
Tutorial group meetings.

Form of Assessment
Written assignment, presentation.

PSY5412 542NP Stress, the Brain and Psychopathology – 3 credits

Coordinator: Rob Markus, Neuropsychology and Psychopharmacology (FPN),
Phone 38 82 474, 40 Universiteitssingel East, Room 2.777a,
E-mail: r.markus@maastrichtuniversity.nl

Objective(s)
To become familiar with interactions between stress and biochemical/pharmacological processes in the human brain that may help explain enhanced susceptibility to cognitive-affective disorders.

Key words
Stress, brain, emotion, depression, psychobiology.

Description of the Course
It has become increasingly clear that stress is one of the most important triggers for cognitive-affective and/or psychiatric disorders, including depression, anxiety, schizophrenia and dementia. In addition, a tremendous amount of biological and cognitive-psychological research has been conducted on the onset and course of such stress-related disorders. Cognitive psychologists have shown that the chance of developing stress-related complaints is enhanced by negative and dysfunctional thoughts, whereas biological psychologists and psychiatrists put more emphasis on the importance of biochemical brain dysfunction. Yet, in spite of intensive research during the past decades, unidirectional biological and cognitive achievements have not yet lead to clear conclusions about critical psychobiological risk factors involved in stress-related psychopathology. 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 to stress-related cognitive-affective complaints and psychiatric disorders.

Literature
Journal articles and book chapters.

Instructional Approach
Tutorial group meetings, lectures, theme-based research excursions.

Form of Assessment
Research proposal and oral defence, written examination with open questions.

4.4 Skills training

PSY4433 451NP Neuropsychological Assessments – 2 credits

Coordinators: Jeanette Dijkstra, Psychiatry and Neuropsychology (FHML), Phone 38 74117, 12 Dr. Tanslaan, Room 4.G4.034, E-mail: j.dijkstra@np.unimaas.nl;
Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 82181, 40 Universiteitssingel East, Room 2.755, E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
To acquaint students with the various aspects of neuropsychological observation, testing and diagnostics.

Key words
Neuropsychology, patient observation, tests, diagnostics, report writing.

Description of the Course
The aim of this skill training is to acquire basic skills necessary for collecting neuropsychological data from subjects and patients.

The courses Brain Damage and Behavioural Disorders run parallel to this skill training and offer one combined practical: Neuropsychological Assessments. Elements of psychological research in relation to 1) intellect, 2) cognition, 3) mood, 4) personality and 5) behaviour will be discussed. The training starts with an introductory lecture in which the principles and interpretation of neuropsychological diagnostics are discussed, illustrated with case studies. Tests used in the practical are demonstrated, including their interpretation and how to report on the outcomes. Next, students are trained in neuropsychological history taking, which they will perform on trained simulation patients who will simulate different kinds of neurological or neuropsychiatric pathology. Furthermore, students are trained in behavioural observation by watching the neuropsychological examination of different patients on video. Finally, using data from the patient history, test observation and examination results, each student writes a comprehensive neuropsychological report. In a final tutorial group meeting, specific problems of the assessments and the individual reports are discussed.

Instructional Approach
Tutorial group meetings.

Form of Assessment
Written neuropsychological report.

PSY4434 452NP Basic Cognitive Psychological Skills – 2 credits

Coordinator: Eric Vuurman, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81046, 40 Universiteitssingel East, Room 2.747,
E-mail: e.vuurman@maastrichtuniversity.nl

Objective(s)
To develop skills required to perform the full cycle of a behavioural experiment.

Key words
Field experiment, applied behavioural testing, data reduction and analysis techniques, report writing.

Description of the Course
This course focuses on the acquisition and training of basic skills needed in cognitive performance research. The course is centred around a psychological experiment studying the detrimental effects of arousal manipulation (environmental noise) on cognitive processing. Students will learn how to perform a field experiment and go through the various stages necessary to acquire the data, analyse and report the results. Students will be required to recruit a small number of subjects and 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 will learn to explore and analyse their data with SPSS and interpret the results. The endpoint of the course is a paper in APA format describing the experiment. Furthermore, an overview of techniques and tests will be given that are currently used to evaluate performance in a number of cognitive domains, such as language, perception, attention and executive functions.

Instructional Approach
Formal introduction in the first week, followed by 6 weeks in which the experiment is carried out and reported. This will be done by pairs of students. Tutorial group meetings to discuss data analysis and report writing and to provide feedback and discussion of the results.

Form of Assessment
Research report on the experiment.

PSY4108 408RM Neuroanatomy – 1 credit

Coordinator: Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 81168, 50 Universiteitssingel, Room 1.110, E-mail: jos.prickaerts@maastrichtuniversity.nl

Objective(s)
To become acquainted with the neuroanatomical terminology and to gain insight into the spatial and functional organization of the brain.

Key words
Neuroanatomy, limbic system, basal ganglia.

Description of the Course
The aim of the training is to become acquainted with the neuroanatomical terminology and to gain insight into the spatial and functional organization of the brain. It is essential to have a basic knowledge of the brain anatomy when working in the field of neuropsychology or neurobiology. Many specific brain areas can be linked to particular functions. Thus, knowledge of the brain anatomy and its main functions allows one to directly link specific neurological or psychiatric disorders to particular brain areas. After a short theoretical introduction the students will study whole brains and brain material of mammals at both macroscopical (visual inspection) and microscopical level. The emphasis will be on major brain systems including the basal ganglia and limbic system.

Instructional Approach
Almost exclusively practical: dissection of sheep brain, studying of microscopical slices of rat brain, working with plastic human brain models, CD-ROM programs and textbook.

Form of Assessment
Pass/fail score based on written exam with open questions.

PSY4421 454NP E-prime – 1 credit
Coordinator: Anita van Oers, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81035, 40 Universiteitssingel East, Room 2.735,
E-mail: anita.vanoers@maastrichtuniversity.nl

Objective(s)
To learn how to program and conduct computer experiments, during 4 practical sessions.

Key words
Programming, computer experiments, practical exercises.

Description of the Course
E-Prime is a comprehensive, relatively easy to learn, suite of applications offering audited millisecond-timing precision, enabling researchers to develop a wide variety of simple to complex experiments in a user-friendly environment that can be implemented with randomized or fixed presentation of text, pictures and sounds (individual or simultaneous). During the training students will first learn to program their own experiments in using both visual and auditory stimuli that will be presented randomly. After programming an experiment students will also learn how this task can be executed to collect usable data during a study. of the training will also illustrate how

the collected data-files can be further handled, analysed and used in other programs like Excel and SPSS. All this can be done using the different components of the E-Prime program.

Literature
Handouts with practical exercises.

Instructional Approach
Practical computer sessions.

Form of Assessment
Programming exercises throughout the training.

PSY4422 455NP Psychophysiological Skills – 1 credit

Coordinators: Pascal van Gerven, Neuropsychology and Psychopharmacology (FPN), Phone 38 84512, 40 Universiteitssingel East, Room 2.742,
E-mail: p.vangerven@maastrichtuniversity.nl;
Eric Vuurman, Neuropsychology and Psychopharmacology (FPN), Phone 38 81046, 40 Universiteitssingel East, Room 2.747, E-mail: e.vuurman@maastrichtuniversity.nl

Objective(s)
To acquire basic, generic skills in psychophysiology.

Key words
Peripheral psychophysiology, methodology.

Description of the Course
The goal of this training is to acquire basic skills in major peripheral psychophysiological measures. The relation between cognitive and psychophysiological variables, such as memory load, mental effort, and attention, will be made clear. In addition, general methodological concepts and issues, such as tonic (baseline) activity, phasic activity, and the so-called 'law of initial value' will be discussed.

The training consists of four meetings. In the first meeting, an overview will be presented of the psychophysiological methods that are relevant to both experimental clinical psychology and neuropsychology. The second meeting is devoted to major domains in psychophysiology, such as heart rate (variability), blood pressure, galvanic skin responses, and pupillometry (i.e., pupil dilation). In this meeting, students acquire basic hands-on experience in the laboratory. The third and fourth meetings are practical sessions, in which an existing dataset will be provided to analyze and report on.

Instructional Approach
Lecture, demonstrations, practical sessions.

Form of Assessment
Short written research report.

PSY4423 458NP Neuropsychology in Practice: From Test Results to Report and Advice – 2 credits

Coordinators: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 82181, 40 Universiteitssingel East, Room 2.755,
E-mail: bart.scholtissen@maastrichtuniversity.nl;
Rudolf Ponds, Psychiatry and Neuropsychology (FHML),12 Dr. Tanslaan, Room 4.G3.061,
Phone 38 76044, E-mail: r.ponds@np.unimaas.nl

Objective(s)
To acquire skills in interpreting neuropsychological data collected by others in order to make a final diagnosis or treatment plan, for scientific or clinical purposes.

Key words
Neuropsychological investigation, test results, interpretation, conclusion, implications, advice, objective neuropsychological tests, scales and questionnaires.

Description of the Course
The aim of this training is to learn to integrate several aspects of a neuropsychological examination. This kind of examination can be used both in the clinical setting as well as 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, theoretical and practical knowledge will be presented in the current skill training in order to achieve the above-mentioned goal. Note that the major focus of this skill training is not testing a patient or a subject participating in a study, but interpretation of the acquired data.

The 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 practice performing and interpreting several 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 that which could be expected will also be addressed.
During meetings three to eight, clinical experts will lead the sessions; 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 lie on the interpretation of the observed patient material.

Instructional Approach
Group discussions, interactive lectures, video material.

Form of Assessment
Report writing, presentations and completion of in-class assignments.

PSY4221 551NP EEG and ERP (Course option A) – 2 credits
Coordinator: Fren Smulders, Cognitive Neuroscience (FPN), Phone 38 81909,
40 Universiteitssingel East, Room 4.777a, E-mail: f.smulders@maastrichtuniversity.nl

Objective(s)
The aim of this training is to give the students hands-on experience with the experimental design, data acquisition and analysis of EEG and ERP experiments.

Key words
Electroencephalography (EEG), Event-related potentials (ERP), electrophysiology, measurement, analysis of brain potentials.

Description of the Course
EEG and ERP offer a combination of supremely precise measurement of the time course of brain processes, low cost, non-invasiveness, and widespread availability. For this reason they make a unique contribution to cognitive neuroscience. Scientific interest in them is still growing, and results have been increasingly integrated with other imaging techniques during the last decades. A lecture and basic literature will introduce students to some background of EEG and ERP research, the terminology of the field, and the possibilities and limitations. A first topic is how to set up an experimental paradigm that is suitable for EEG and ERP measurement. Then students shall study practical measurement issues, such as electrode placement, and the types of artifacts that one may expect. Finally, there is the interpretation of the resulting data. Successful measurement requires an understanding of some basic signal analysis techniques that are specific for EEG and ERP, such as artifact management, spectral analysis, filtering, ERP averaging, time-frequency analysis etc. After that, there will be a hands-on training in smaller groups in running an ERP experiment, including electrode application, minimizing artifacts, and hygiene and safety in the lab. A simple experimental paradigm will be used that gives interesting and reliable results. Data processing will include various EEG analyses that are commonly used, e.g., analyses in the time and frequency domain.

Literature
Journal articles and handbooks.

Instructional Approach
Tutorial group meetings with student presentations, lecture, a lab session, and analysis sessions.

Form of Assessment
A paper and a practical report.

PSY5421 552NP Neuropsychological Rehabilitation (Course Option B) – 1 credit

Coordinator: Caroline van Heugten, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML),Phone 38 84091,
12 Dr. Tanslaan, Room 4.E3.017, E-mail: c.vanheugten@maastrichtuniversity.nl

Objective(s)
To provide an overview of designs used in clinical and experimental neuropsychological rehabilitation and into the diverse possibilities with respect to clinical rehabilitation and research into the effectiveness of rehabilitation.

Key words
Rehabilitation, treatment, acquired brain damage, effectiveness.

Description of the Course
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, an elaboration will be given on the basic premises and the basic 'pitfalls' in this type of research and the possibilities to circumvent these problems by proper choice of approach and design. Various designs are compared with 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 practical skills will be trained with respect to rehabilitation principles. Skills will be developed with respect to cognitive training and psycho-education. Also forms of complex behavioural treatment will be discussed.

Instructional Approach
Group meetings including lectures, demonstrations, practicals, working group discussions.

Form of Assessment
Presentation, 2 short papers.

PSY5222 553NP Data Management (Course Option B) – 1 credit

Coordinator: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81940, 40 Universiteitssingel East, Room 2.743,
E-mail: e.theunissen@maastrichtuniversity.nl

Objective(s)
To acquire basis skills in data management using the software package Excel.

Key words
Data management, data analysis, spreadsheets, graphs, Excel.

Description of the Course
This programme Exel has many features that can be very helpful to overcome time-consuming formatting of databases. First, an introduction of the basic features of Excel will be presented. Being familiar with these basic aspects is necessary to understand copying of values and formulas (relative or absolute). Also, Excel enables students to make various types of graphs, which can be very helpful for quickly visualizing data. A fourth aspect that will be dealt with is pivot tables, a very helpful tool to organize data in any manner students find most suitable for further data handling. A final option that will be dealt with is the use of macros. These are especially helpful when repetitious changes in layout or recalculations have to be made.

Instructional Approach
Group meetings with demonstrations based on student data. Students may provide the instructor with data to be used as examples.

Form of Assessment
Written assignment.

4.5 M&T workshops

PSY4431 461NP Research Theory and Designs – 1 credit
Coordinator: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 82181, 40 Universiteitssingel East, Room 2.755,
E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
To increase knowledge about research theory and designs encountered in the domain of neuropsychological 'brain and behaviour' research.

Key words
Research theory, research design, epidemiology, fMRI, animal models, peer reviewing.

Description of the Course
The aim is to provide the student with a basic understanding of theoretical and practical issues that are important for the execution of 'evidence-based' (intervention) research in the domain of brain & behaviour. This workshop will elaborate on basic issues of research theory and methodology of scientific research with a focus upon the domain of brain and behaviour. The student will get insight into issues involving 'the empirical cycle' and basic issues of science. Several methodological approaches in the domain of neuropsychology, neuropsychiatry, cognitive and behavioural neuroscience are presented and discussed. There are four sessions. The first three meetings of the workshop will be led by different senior researchers, who will each focus on different aspects of theory and methodology in the domain of brain and behaviour research.

These three meetings will have an identical format, each consisting of two main parts. The first part is a lecture, which will focus on aspects of approaches, conceptualizations, and theoretical background in the various domains of neuropsychological research (e.g. cognitive, experimental, clinical, medical, developmental neuropsychology, cognitive neuroscience, basic and clinical neuroscience). Furthermore, issues related to causality (e.g., causal or correlative inferences), issues related to the multifactorial nature of cognitive and behavioural functioning (e.g., biological versus environmental determinants), and issues related to possibilities for execution of neuropsychological research (designs, short overview of statistical approaches) will be discussed. During the second part, the focus will concern practical aspects of research theory and design. During the final session, students' presentations will form the basis of a group discussion on research theory and design.

Instructional Approach
Lectures, discussion groups, presentations, use of research reports and publications as 'discussion material'.

Form of Assessment
Individual presentation.

PSY4432 463NP Neuropsychological Assessment in Children – 1 credit
Coordinators: Peter Stiers, Neuropsychology and Psychopharmacology, Phone 38 81514, 40 Universiteitssingel East, Room 2.755, E-mail: peter.stiers@maastrichtuniversity.nl

Objective(s)
To gain insights into the design and interpretation of a clinical investigation, particulary in the context of early onset neurological conditions in children.

Key words
Multiple disability, neuropediatrics, specific impairment, neuropsychological methods, congenital disorders, magnetic resonance imaging.

Description of the Course
In this workshop the aim 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 to methodological aspects of assessment. 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 in the need to integrate information from different sources: medical history, neurological disorders, radiology, interview, test result, scientific literature, etc.

Instructional Approach
Practical in neuropsychological assessment, lectures, discussions of case reports and weekly assignments.

Form of Assessment
Interpretation of neuropsychological test data in a short paper.

PSY4109 409RM Research Ethics – 1 credit
Coordinator: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81940, 40 Universiteitssingel East, Room 2.743,
E-mail: e.theunissen@maastrichtuniversity.nl

Objective(s)
To critically examine ethical issues and to learn about ethical and legal regulations in research.

Key words
Ethics, legal, guidelines.

Description of the Course
Students will learn to think critically about ethical dilemmas that psychologists encounter when exercising their profession. This workshop will discuss legal and ethical conflicts that are involved in psychological research and clinical practice. Students will be introduced to the ethical and legal rules and boundaries in human research, and to the organizations and institutes supervising the application of these rules.

Psychologists always need to make sure that they carry out their work in an ethical and legally sound way. However, there is often a conflict of interests of the involved parties. In all circumstances, however, it is the psychologist's primary task to secure the patients/participants welfare and to keep risks at a minimum. Therefore psychologists should know which ethical aspects are of importance and which laws and rules need to be applied and also which institutions supervise on the application of these rules. In addition, these aspects should be taken into consideration when writing and submitting a research proposal to an ethical commission.

The following topics will be discussed:
- Examples of ethical and legal failings
- Necessity of ethical and legal rules
- Different guidelines: declaration of Helsinki, guidelines for Good Clinical Practice, etc.
- Working with participants/patients: rights and duties, confidentiality, data processing and storage, etc.
- Applying ethical and legal rules in e.g., protocol, case report form, informed consent, etc.
- Ethical and legal reviews.

Literature
Links to relevant literature on EleUM

Instructional Approach
Discussion groups and lectures.

Form of Assessment

Presentation.

PSY4333 465NP Epidemiology – 1 credit
Coordinator: Marcus Huibers, Clinical Psychological Science (FPN), Phone 38 81487, 40 Universiteitssingel East, Room 5.750, E-mail: m.huibers@maastrichtuniversity.nl

Objective(s)
To get acquainted with the principles of epidemiological research.

Key words
Epidemiology, methodology, research designs.

Description of the Course
Epidemiology often is referred to as "quantitative medicine". In general, epidemiology deals with methodology issues in the field of health research, including mental health. Students in this workshop will be introduced to the principles of epidemiological research. Topics that are covered in the workshop include: frequency measures, association measures, sources of bias, validity issues, cohort studies, clinical trials, and systematic reviews. The theory of epidemiology will be studied and applied in interactive workshop sessions.

Literature
Required reading will consist of several chapters from a clinical epidemiology textbook and additional research papers combined in an e-reader. In addition to the workshops sessions, students are expected to spend 5 hours a week on reading and homework assignments.

Instructional Approach
Format of the workshop is a series of four 2-hour sessions and a fifth presentation session. Starting each session, the lecturer will give a 30-minute presentation of the topics covered in that session, followed by a 30-minute discussion of these topics. The second hour will be spent on group assignments under supervision of the lecturer.

Form of Assessment
Group assignment: During the entire workshop, students will work on a research proposal in groups of three. Students will prepare the proposal during the sessions; the remainder of the work is part of the homework assignments. The groups will give a

10-minute presentation of their proposals in a final session. Members from the other groups will act as the jury. Based on the presentations and feedback, the lecturer will give the final assessment (fail or pass).

PSY4334 466NP Imaging – 2 credits

Coordinator: Vincent van de Ven, Cognitive Neuroscience (FPN), Phone 38 84510, 40 Universiteitssingel East, Room 4.761, E-mail: v.vandeven@maastrichtuniversity.nl

Objective(s)
Introducing the basic principles of the most common imaging methods, and critical assessment of these methods in studying human brain functions and dysfunctions.

Key words
Magnetic resonance imaging (MRI), functional MRI, structural MRI, positron emission tomography (PET), neuroimaging.

Description of the Course
This workshop is intended to provide:
- introductory knowledge of the basic principles underlying the most common imaging methods;
- appreciation of potentialities and limitations of various neuroimaging methods in studying human brain functions and dysfunctions.

The investigation of human brain anatomy and functions using a range of imaging methods represents the most influential development in Psychology in the last years. In this workshop, essential facts about contemporary major structural and brain mapping techniques, including Positron Emission Tomography (PET), structural and functional Magnetic Resonance Imaging (fMRI) will be reviewed. The focus will be on the strengths and weaknesses of each of these methods and on the description of relevant applications in the normal and pathological brain. These topics will be further investigated through lectures and paper discussions.

Literature
Selected papers which will be made available prior to the start of the course.

Instructional Approach
Lectures, paper discussion, demonstration visit to the MRI scanner.

Form of Assessment
Paper assignment: Preparing a research proposal.

PSY4335 467NP Psychopharmacology - 1 credit

Coordinator: Wim Riedel, Neuropsychology and Psychopharmacology (FPN),
Phone 38 84322, 40 Universiteitssingel East, Room 2.777a,
E-mail: w.riedel@maastrichtuniversity.nl

Objective(s)
Getting familiarized with current research topics in Psychopharmacology; learning to know the drivers and applications; i.e. neuropsychiatric disease understanding and how this relates to development of new drugs.

Key words
Pharmacology, genetics, physiological psychology, experimental neuropsychology, biological psychiatry, drug development, biomarkers.

Description of the Course
The workshop aims to present Psychopharmacology in a broad sense. The multidisciplinary nature of psychopharmacology encompasses pharmacology, molecular biology, genetics, physiological psychology, experimental, clinical and cognitive neuropsychology and biological psychiatry. The emphasis will be on understanding drug development, drug action, drug research, animal and human pharmacological models of clinical disorders, experimental / clinical trial design and the development of biomarkers, real measures and surrogate measures of drug efficacy. The course will focus on major areas in Psychopharmacology such as Addiction, Depression, Anxiety, Psychosis and Cognition. These areas will be illuminated form both the perspectives of basic neuroscience including animal subjects as well as experimental and clinical human psychopharmacology.

Instructional Approach
Each half-day the programme will consist of a sequence of three elements:
- Key note Lectures by internationally renowned speakers in the morning
- Presentations of recent research by PhD students or junior researchers
- Forum report by students about the poster-presentations

The workshop offers plenty of opportunity for the Master's student to interact with PhD students, junior and senior staff and the invited guest speakers.

Form of Assessment
Short presentation in the forum discussion.

PSY5101 501RM Advanced Academic Writing – 2 credits

Coordinator: Caroline van Heugten, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 84091, 12 Dr. Tanslaan, Room 4.E3.017, E-mail: c.vanheugten@maastrichuniversity.nl

Objective(s)
The goals of the course are to familiarize the Research Master's students with the academic writing process involving research protocols, grant proposals, scientific papers and posters. A variety of academic writing skills will be practiced.

Key words
Writing skills, research protocol, author guidelines.

Description of the Course
During this course, students will be familiarized with the different phases of writing scientific products, such as research protocols, scientific publications, grant proposals and scientific posters. In advance of their upcoming career as a scientist and in the nearby future their masters thesis, they will learn to define and crystallize a research question based on its feasibility and scientific relevance; to prepare and structure their arguments and to plan the different parts of the paper; to think about suitable designs and research methods for data acquisition and analysis, and, finally, to learn how to walk through the writing process starting from draft to the final version. The student will get acquainted with the competitive nature of academic writing in an exercise environment. This all will be accomplished by competence-based learning in which they have to integrate factual knowledge (from the literature) into skill-based practice (by exercise).

Instructional Approach
A combination of lectures, take home writing assignments and take home review assignments, a workgroup meeting with poster presentations.

Form of Assessment
A positive evaluation of this workshop is based on:
- attendance at the lectures;
- fulfilling all take-home writing and review assignments;
- writing a final research proposal of sufficient quality (introduction/theoretical background and method/workplan); feedback about the proposal will be given on an individual level;
- presenting a poster.

4.6 Internships

PSY5102 502RM Research internship and PSY5103 Master's thesis – 30 or 50 credits

Coordinator: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 82181, 40 Universiteitssingel East, Room 2.755,

E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
Conduct an empirical research project under supervision, resulting in a thesis.

Key words
Internship, research, Master's thesis.

Description of the internship
The second part of the 2nd year of the Research Master's programme is devoted to arranging and conducting a research internship. As a result of the many international research contacts our faculty members have established, a substantial number of students will conduct their research internship abroad. Students finalize the Master's programme by writing a thesis on their internship.

The internship can be done at Maastricht University or at external research institutes. In all cases, two assessors will evaluate the research proposal and Master's thesis. At least one assessor has to be a member of the Faculty of Psychology and Neuroscience (FPN) or the Faculty of Health, Medicine and Life Sciences (FHML). The other assessor might be a (senior) researcher at, for example, the institute where the data are collected.
A detailed guide on research internships and Master's thesis can be found on EleUM > Students Research Master Faculty of Psychology and Neuroscience > internships.

Form of Assessment
NP students can also choose to conduct both a research and a clinical internship, preferably in the same institution (see Clinical internship and Minor's thesis below). In this case, the research internship will be assigned 30 credits: 20 for the practical activities and research proposal (pass/fail) and 10 for the Master's thesis (graded). For students who do not complete a clinical internship and Minor's thesis (see below), the research internship will be assigned 50 credits: 36 credits (assessed pass/fail) for the research activities, including the proposal, and 14 credits (graded assessment) for the Master's thesis.
For more information about research internships contact the general coordinator, who is also the internship contact of the specialization NP:

General Coordinator Internships: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 82181, 40 Universiteitssingel East, Room 2.755,
E-mail: bart.scholtissen@maastrichtuniversity.nl

PSY5104 503RM Clinical internship and PSY5105 Minor's thesis – 20 credits

Coordinator: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 82181, 40 Universiteitssingel East, Room 2.755,
E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
Direct experience of the work environment of the clinical psychology. Training of clincial skills in real-life situation.

Key words
Clinical research, clinical practice, clinical training, psychodiagnostic investigation, patient contact.

Description of the internship
Students who are specializing in Psychopathology are required, and in Neuropsychology may choose, to conduct a 13-week clinical internship in an approved setting, as an elective. The clinical internship can be conducted in conjunction with the research internship or separately. Students are required to submit an additional 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 organization and practice of mental health care, as well as basic experience in clinical diagnosis and therapeutic interventions. For neuropsychology students who choose to do a clinical internship, this internship and Minor's thesis will be assigned 20 credits, and the research internship and thesis 30 credits.

A detailed guide on clinical internships and Minor's thesis can be found on EleUM > Students Research Master Faculty of Psychology and Neuroscience. Although not required to do so by 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 2 weeks.

Form of Assessment
The clinical internship and Minor's thesis will together be assigned 20 credits:
16 credits for clinical activities and clinical research proposal (pass/fail assessment) and 4 credits for the Minor's thesis (graded assessment)

For more information about research internships contact the general coordinator or go directly to the internship contact of the specific specialization programme:

General Coordinator Internships, and Neuropsychology track: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 82181,
40 Universiteitssingel East, Room 2.755, E-mail: bart.scholtissen@maastrichtuniversity.nl

4.7 Schedule Neuropsychology

Period	YEAR 1
Period 0, 1 week 31th August – 4th September 2009	Introduction Week
Period 1, 7 weeks 7th September – 23th October 2009	**PSY4105 405RM Interdisciplinary Perspectives** (total of 3 credits)
	Core Courses: PSY4407 441NP Brain Damage (4 credits), PSY4408 442NP Behavioural Disorders (4 credits) & PSY4106 406RM Advanced Statistics I (total of 2 credits)
	Skill Training: PSY4433 451NP Neuropsychological Assessments (2 credits)
	PSY4100 404RM Colloquia (total of 5 credits)
Period 2, 7 weeks 26th October – 11th December 2009	**PSY4105 405RM Interdisciplinary Perspectives**
	Core courses: PSY4409 443NP Arousal and Attention(4 credits), PSY4410 444NP Cognitive Aging (4 credits) & PSY4106 406RM Advanced Statistics I
	Skill training: PSY4434 452NP Basic Cognitive Psychological Skills (2 credits)
	PSY4100 404RM Colloquia
Christmas break	
Period 3, 4 weeks 4th January – 29th January 2010	**Core course:** PSY4411 445NP Biopsychology (3 credits) & PSY4106 406RM Advanced Statistics I
	Workshop: PSY4431 461NP Research Theory and Designs (1 credit)
	Skill Training: PSY4108 408RM Neuroanatomy (1 credit)
	PSY4100 404RM Colloquia
Period 4, 4 weeks 1st February – 5th March 2010	**Core course:** PSY4412 446NP Brain, Learning and Memory (3 credits) & PSY4107 407RM Advanced Statistics II (total of 3 credits)
	Workshop: PSY4432 463NP Neuropsychological Assessment in Children (1 credit)
	Skill training: PSY4421 454NP E-prime (1 credit)
	PSY4100 404RM Colloquia
Period 5, 4 weeks 8th March – 2nd April 2010	**Core course:** PSY4413 447NP Executive Functions and Control of Action (3 credits) & PSY4107 407RM Advanced Statistics II
	Workshop: PSY4109 409RM Research Ethics (1 credit)
	Skill training: PSY4422 455NP Psychophysiological Skills (1 credit)
	PSY4100 404RM Colloquia
Period 6, 5weeks 12th April – 14th May 2010	**Core Course:** PSY4414 448NP Neuropsychiatric Disorders (3 credits)
	Workshop: PSY4333 465NP Epidemiology (1 credit)
	Skill training: PSY4423 458NP Neuropsychology in Practice: From Test Results to Report and Advice (total of 2 credits)
	PSY4100 404RM Colloquia
Period 7, 5 weeks 17th May – 18th June 2009	**Core course:** PSY4415 449NP Neuropsychopharmacology (3 credits)
	Workshop: PSY4334 466NP Imaging (2credits) & PSY4335 467NP Psychopharmacology (1 credit)
	Skill training: PSY4423 458NP Neuropsychology in Practice: From Test Results to Report and Advice
	PSY4100 404RM Colloquia

Period	YEAR 2
Period 1, 4 weeks 31th August – 25th September 2009	**Core course:** PSY5411 541NP Cognitive Development (3 credits)
	Workshop: PSY5101 501RM Advanced Academic Writing (total of 2 credits)
	Skill training: PSY4221 551NP ERP and EEG (course option A, 2 credits) & PSY5421 552NP Neuropsychological Rehabilitation (course option B, 1 credit)
Period 2, 4 weeks 28th September - 23th October 2009	**Core course:** PSY 5412 542NP Stress, the Brain and Psychopathology (3 credits)
	Workshop: PSY5101 501RM Advanced Academic Writing
	Skill training: PSY4221 551NP EEG and ERP (course option A) & PSY5222 553NP Data Management (course option B, 1 credit)
32 weeks	**PSY5102 502RM Research internship & PSY5103 Master's thesis** (30 or 50 credits)
	PSY5104 503RM Clinical internship & PSY5105 Minor's thesis (20 credits)

Specialization Psychopathology (PP)

The specialization in Psychopathology provides students the theoretical background and clinical insights necessary for future research in the various fields related to mental health: in particular experimental psychopathology, clinical psychology, and psychiatry. The interactive core seminars cover biopsychosocial theories and state-of-the-art research on the epidemiology, genetics, psychological and neurobiological mechanisms underlying onset and course, treatment, and prevention of mental disorders throughout the life cycle. In addition to coverage of specific disorders, attention is paid to positive psychology and to broader issues and controversies, such as gender and cultural differences, the validity of experimental and animal models of psychopathology, and gene-environment interactions. The programme includes training in diagnostic and other clinical skills, as well as research experience in health care settings. The possibility of designing individualized electives or choosing electives from other tracks affords students not only an in-depth understanding of the multidisciplinary approaches to psychopathology but also the opportunity to tailor the programme along the lines of their personal research interests.

Psychopathology Coordinator:

Nancy Nicolson, Psychiatry and Neuropsychology (FHML), Phone (043) 36 88684, Vijverdal, Room SN2.068, E-mail: n.nicolson@sp.unimaas.nl

5.1 Interdisciplinary Perspectives

PSY4105 405RM Interdisciplinary Perspectives – 3 credits

Coordinators: Nancy Nicolson, Psychiatry and Neuropsychology (FHML), Phone 36 88684, Vijverdal, Room SN2.068, E-mail: n.nicolson@sp.unimaas.nl; Rob Markus, Neuropsychology and Psychopharmacology (FPN), Phone 38 82 474, 40 Universiteitssingel East, Room 2.777a, E-mail: r.markus@maastrichtuniversity.nl; Milene Bonte, Cognitive Neuroscience (FPN), Phone 38 84036, 40 Universiteitssingel East, Room 4.743, E-mail: m.bonte@maastrichtuniversity.nl; Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 81168, 50 Universiteitssingel, Room 1.110, E-mail: jos.prickaerts@maastrichtuniversity.nl

Objective(s)

To understand and integrate research approaches from distinct but related disciplines.

Key words

Memory, developmental psychology.

Description of the Course

This lecture course, attended by all first-year students, is designed to highlight selected research topics from the perspectives of cognitive neuroscience, fundamental

neuroscience, neuropsychology and psychopathology. The aim is to illustrate how the distinct but inter-related approaches to questions in the field of brain and behaviour can enrich our understanding of underlying mechanisms as well as cognitive, emotional and behavioural outcomes in health and disorder.

Instructional Approach
A series of four lectures for each of two broad themes. Faculty members from each of the four specializations will present lectures in successive weeks.
Required readings, assigned by each lecturer, will be made available prior to the first meeting of a new theme.

Form of Assessment
Following each series of four lectures, an exam will be given, covering material from all of the assigned readings and lectures for that theme. A final pass/fail score is based on the average grade obtained on the two exams.

5.2 Colloquia

PSY4100 404 RM Colloquia - 5 credits
Coordinators: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 81940, 40 Universiteitssingel East, Room 2.743, E-mail: E.Theunissen@maastrichtuniversity.nl;
Joel Reithler, Cognitive Neuroscience (FPN), Phone 38 81896, 40 Universiteitssingel East, Room 4.761, E-mail: J.Reithler@maastrichtuniversity.nl;
Anne Roefs, Clinical Psychological Science (FPN), Phone 38 82191, 40 Universiteitssingel East, Room 3.747, E-mail: A.Roefs@maastrichtuniversity.nl;
Harry Steinbusch, Psychiatry and Neuropsychology (FHML), Phone 38 81021, 50 Universiteitssingel, Room 1.112, E-mail: h.steinbusch@np.unimaas.nl

Objective(s)
The purpose of the colloquia is to foster interdisciplinary knowledge and interaction among students from different specializations and with varying interests. In addition, the assignments provide students with valuable practice in writing research proposals and in peer reviewing - two extremely important skills for a young scientist.

Key words
Interdisciplinary knowledge, research proposal, peer review.

Description of the Course
Weekly colloquia are presented by UM faculty and by visiting guest lecturers. The colloquia focus in depth on one of a wide range of topics, with issues transcending the courses and even the specializations. Each colloquium will consist of a lecture followed by active discussion, prepared and chaired by the lecturer (for guest lecturers, the UM

host may fill this role). Each specialization will organize 7 or more colloquia so that a total of approximately 24 colloquia will be offered each year.

Literature
Most colloquium speakers will provide background readings, which will be made available on EleUM.

Instructional Approach
Students will attend at least 15 colloquia, and will choose one topic of these colloquia to base their research proposal on. They will also provide peer reviews on two of their fellow students' research proposals.

Form of Assessment
Students are evaluated (pass/fail) on the basis of attendance, a written research proposal, and submission of two peer reviews.

5.3 Core courses

PSY4511 471PP Anxiety Disorders – 3 credits
Coordinator: Arnoud Arntz, Clinical Psychological Science (FPN), Phone 38 81228, 40 Universiteitssingel East, Room 5.735, E-mail: arnoud.arntz@maastrichtuniversity.nl

Objective(s)
To examine current knowledge and controversies in the field of anxiety disorders, especially as related to the difference between normal and abnormal anxiety; the classification of anxiety disorders; the aetiology and maintenance processes of anxiety disorders and its treatment.

Key words
Anxiety, anxiety disorders, phobia, obsessive compulsive disorder, posttraumatic stress disorder.

Description of the Course
This seminar covers the main findings and controversies related to the anxiety disorders. While treatment issues are dealt with, the emphasis of the course is on biological and psychological mechanisms that are involved in the origin and maintenance of the various anxiety disorders.

Both in North America and in West Europe anxiety disorders are the largest group of mental disorders for which patients are referred and anxiety disorders are relatively well studied, well understood and treatment outcome is relatively favourable. As to the aetiology the focus will be on the role of life events, genetics and stable personality features in the origin of anxiety disorders. With regards to the maintenance of the

disorders the course concentrates first of all on anxiety related aberrations in the processing of negatively valenced information. Such selective processing is studied with regards to perception, attention, memory, reasoning and interpretation. Furthermore students study the maintaining role of 'safety behaviours': attempts to prevent a feared catastrophe with the ironic effects that anxiety is reinforced. Throughout the course the role of the various neurotransmitters in the anxiety disorders are highlighted. Students are trained in the use of various experimental (laboratory) paradigms that are typically employed in the study of the cognitive psychology/biological psychology of anxiety disorders: Carbon dioxide inhalation, dot-probe methodology, various tests to measure interpretation biases etc.

Literature
- Journal articles;
- Handbook: Barlow, D.H. (2008). *Anxiety and its Disorders* (2nd ed) New York & London: The Guilford Press.

Instructional Approach
Interactive seminar meetings, including lectures, group discussions, and student presentations.

Form of Assessment
Written papers and presentations.

PSY4512 472PP Mood disorders – 3 credits

Coordinators: Frenk Peeters, Psychiatry and Neuropsychology (FHML), Phone 38 75696, 12 Dr. Tanslaan, Room 4.G4.035, E-mail: f.peeters@sp.unimaas.nl

Objective(s)
To give a broad overview of the scientific state-of-the-art in the field of mood disorders.

Key words
Epidemiology, etiology, course, treatment, major depression, bipolar disorder, dysthymia.

Description of the Course
This course is intended to give the student an overview of current concepts and research in the field of mood disorders. During the course, fundamental aspects of onset and course of the most important mood disorders (major depression, bipolar disorder and dysthymia) will be addressed. In the last decades, it has become increasingly clear that mood disorders are chronic psychiatric disorders characterized by acute episodes, relapses, recurrences, and residual symptomatology. Both onset and course of mood disorders are the result of complex interactions between distal (e.g., genetic and developmental) and proximal (e.g., severe life-events) risk factors. This is illustrated by discussion of mood disorders across the life span in the light of biological, psychological, and social approaches. Current research strategies aimed at clarifying

the role of these different aspects will be the central theme throughout the course. Based on this framework, state-of-the-art treatments for mood disorders are addressed and illustrated where possible.

Instructional Approach
Meetings will consist of short interactive lectures, small group discussion of literature, and presentations by students of key literature based on literature searches, followed by discussion. Research proposals will be presented and discussed during the last meetings.

Form of Assessment
Presentations, research proposal.

PSY4513 473PP Stress and Trauma – 3 credits

Coordinator: Nancy Nicolson, Psychiatry and Neuropsychology (FHML), Phone 36 88684, Vijverdal, Room SN2.068, E-mail: n.nicolson@sp.unimaas.nl

Objective(s)
To learn how stress can contribute to psychopathology, by critically evaluating theories and evidence concerning cognitive, affective,
biological and social mechanisms; to learn about current research methods and designs in this field, their strengths and limitations; to understand how knowledge of stress processes can inform prevention and treatment approaches; to improve presentation and scientific writing skills.

Key words
Stress psychobiology, HPA axis, childhood adversity, life events, chronic stress, posttraumatic stress disorder, treatment, coping, cognitive mechanisms, gender differences, gene-environment interaction, experimental design, animal models.

Description of the Course
This seminar is designed to give students an in-depth overview of key concepts and controversies in current stress research, with an emphasis on the role stress is thought play in the etiology, pathophysiology, and course of psychiatric disorders over the lifespan. The focus will be on the interrelationship of biological and psychological processes in healthy adaptation as well as in psychopathology. In the second half of the course, we will apply this detailed knowledge about how individuals respond to and cope with various forms of stress to understand aspects of posttraumatic stress disorder (PTSD): epidemiology, risk and protective factors, prevention, and evidence-based treatment options.
Throughout the seminar, attention will be paid to how current theories about stress and trauma can be translated into testable hypotheses and feasible research designs. In addition, we will consider the generalizability and clinical relevance of findings from experimental stress exposure paradigms and studies in animal models.

Literature
- Journal articles and book chapters.
- Recommended book: Friedman, M.J., Keane, T.M., Resick, P.A. (Eds.) (2007). *Handbook of PTSD*. New York: Guilford Press. (copies in the UM Library)

Instructional Approach
The seminar consists of interactive meetings, including an introductory lecture, small group and plenary discussions, and individual presentations of recent literature.

Form of Assessment
Individual presentation, peer review, research proposal, participation.

PSY4514 474PP Developmental Psychopathology – 3 credits

Coordinator: Kathleen Restifo, Clinical Psychological Science (FPN), Phone 38 81593, 40 Universiteitssingel East, Room 5.731a, E-mail: k.restifo@maastrichtuniversity.nl

Objective(s)
To learn to evaluate research in developmental psychopathology and to become familiar with the current knowledge about specific child and adolescent disorders such as depression, anxiety, conduct problems and autism.

Key words
Developmental psychopathology, child and adolescent disorders, developmental research, depression, anxiety, conduct problems, autism.

Description of the Course
The aim of this seminar is to introduce students to the field of developmental psychopathology, an interdisciplinary field which employs the framework of normal development to understand psychopathology as it unfolds throughout the lifespan. Developmental psychopathology draws on research from developmental and clinical psychology, behavioural genetics, neurology, neuropsychology, and psychiatry among other fields, and attempts to integrate concepts, methods and findings from these fields into models which attempt to explain how psychopathology develops, including etiological factors and causal pathways. The research methods employed can include cross-sectional or longitudinal designs; normal, high risk or clinical samples, prevention and treatment studies, neurodevelopmental studies, and behavioural genetic studies, to name a few.

The focus of this seminar will be to examine child psychopathology through the lens of developmental psychopathology. It is not possible to systematically cover all aspects of developmental child psychopathology in one seminar. Rather, the aims are as follows:
1) Introduce the major theories and research methods, and the variety of disciplines involved;
2) Critically analyse recent and/or influential research studies in four broad areas

of psychopathology: 1) anxiety, 2) depression, 3) conduct disorders and 4) autism. Treatment approaches will be discussed in the last class;
3) Critically examine competing models of the interaction between etiological factors in development of psychopathology: genetic factors, family factors and parenting;
4) Examine the relationship between normal developmental processes/pathways and development of psychopathology; for example, between attachment and psychopathology;
5) Present videotaped clinical case material to illustrate therapy techniques.

Literature
Basic textbooks (available through the Study Landscape);
Cicchetti, D., & Cohen, D.J. (2006). *Developmental psychopathology* (2nd Ed.). New Jersey: John Wiley and Sons. Volume 1: *Theory and method. Volume 2: Developmental neuroscience. Volume 3: Risk, disorder and adaptation*; Essau, C. (Ed) (2006). *Child and adolescent psychopathology*: *Theoretical and Clinical Applications*. London: Routledge.

Instructional Approach
Interactive meetings, including group discussions, student presentations.

Form of Assessment
Presentation, research paper, and participation in the discussions.

PSY4515 475PP Somatoform Disorders – 3 credits

Coordinator: Johan Vlaeyen, Clinical Psychological Science (FPN), Phone 38 81047, 40 Universiteitssingel East, Room 3.738, E-mail: j.vlaeyen@maastrichtuniversity.nl and University of Leuven, E-mail: johan.vlaeyen@psy.kuleuven.be

Objective(s)
At the end of this course, students are able to identify major cognitive and behavioural mechanisms that are responsible for then aetiology and maintenance of chronic bodily complaints. Students will be familiar with the psychological aspects of two common bidily sensations: pain and dyspnea. Moreover, students will know the typical features of the most common somatoform disorders, including pain disorder, hypochodriasis, body dysmorphic disorder. Finally, students will be able to describe the state of the art cognitive-behavioural treatment for these disorders.

Key words
Catastrophic interpretations of bodily sensations, symptom perception, hypervigilance, chronic pain, hypochodriasis, dyspnea, body dysmorphic disorder

Description of the Course
Despite the absence of an medical cause of their complaints, many individuals with longstanding bodily complaints seek medical care, often without success This course focuses on the mental representations of bodily symptoms, and their effects

on observable behaviours that can be quite disabling. In the last decennium, a shift in scientific focus has occurred from stable individual traits towards more dynamic transdiagnostic psychological processes. The emphasis of this course is on the cognitive and behavioural mechanisms that play a role in the aetiology and maintenance of chronic bodily complaints.. In line with these recent developments, cognitive-behavioural approaches have emerged that appear quite successful and cost-effective. Because of its prototypical character, the problem of chronic pain and pain disorder will be used as the lead in this course.

The course starts with three introductory sessions during which a modern approach of somatoform disorders is presented, and during which students will familiarize themselves with theoretical approaches of symptom perception and catastrophic (mis)interpretations of bodily symptoms, and cognitive-behavioural interventions for pain disorder. In each of the four subsequent "meet-the-expert" sessions, a lecturer specialized in a particular somatoform disorder from a collaborating university lab is invited, and students will be given the opportunity to actively interact with the experts. If possible, a visit to one of the experts' labs will be organized. Usually, this is the lab of the research group Health Psychology of the University of Leuven (Belgium). The course ends with a small symposium during which students present their research paper, This interactive symposium will also be open to other staff.

Topics included: overview of somatoform disorders; biomedical and biopsychosocial models of health and illness; controversies in the assessment of physical complaints; common mechanisms of unexplained complaints: a symptom perception approach; the role of catastrophic misinterpretations of bodily sensations: pain and dyspnea; the role of attribution, attention, and affect; coping or acceptance; cognitive-behavioural treatments of somatoform disorders, including pain disorder, hypochodriasis, and body dysmorphic disorder; self-management strategies.

Literature
For each meeting and/or topic a selected number of research papers will be suggested and made available through EleUM.

Instructional Approach
Interactive seminar meetings, including lectures, meetings with international experts, group discussions, and student presentations. Students work in teams of two on a research paper. The final meeting is usually a symposium during which students present their research papers.

Form of Assessment
Research paper and presentation, written examination.

PSY4516 476PP Psychosis – 3 credits
Coordinator: Jim van Os, Psychiatry and Neuropsychology (FHML), Phone 38 75443, 12 Dr. Tanslaan, Room 3.G4.044, E-mail: j.vanos@sp.unimaas.nl

Objective(s)
To understand psychosis, in particular: its overlap with normal mentation; its ontogeny; diagnostic conondrums; linking brain and mind; linking genes and experience; how to help patients.

Key words
Psychosis, genetics, epidemiology, cognition, treatment, prevention.

Description of the Course
This seminar aims to give the student an overview of current thinking and unresolved issues in schizophrenia research. The process of psychotic disorder and psychosis transition has been the subject of intense study in the last decade. Early epidemiological approaches have been complemented with studies of cognition and neuroimaging and, finally, treatment trials. There is now evidence to suggest that the onset of psychotic disorder is the endpoint of a process of interactive etiological forces that involve genetic background factors associated with low grade, non-clinical expression of psychosis in the general population, environmental stressors such as cannabis use and psychological trauma, and a number of cognitive vulnerabilities in the realm of neuropsychology and social cognition. In addition, it is now increasingly clear that the process of onset of psychosis is associated with neurocognitive changes and progressive sensitization to dopaminergic stimulation, greater quantities of which may predict subsequent brain changes and poorer outcome.

Instructional Approach
The seminar consists of interactive meetings, which consist of lectures, group discussions, and student presentations.

Form of Assessment
Written papers, presentation, and research proposal.

PSY4517 480PP Eating Disorders & Addiction – 4 credits

Coordinator: Anita Jansen, Clinical Psychological Science (FPN), Phone 38 81910, 40 Universiteitssingel East, Room 3.731a, E-mail: a.jansen@maastrichtuniversity.nl

Objective(s)
To understand the major features of eating disorders and addictive disorders; to identify and unravel psychological mechanisms that explain the origin and maintenance of eating disorders and addictive disorders; to find out which treatment strategies are commonly used, how effective they are and why; to identify strategies or interventions that reduce or eliminate (symptoms of) the eating and addictive disorders.

Key words
Eating disorders, addictive disorders.

Description of the Course
This course aims to give the student a state-of-the-art overview of current thinking and unresolved issues in research on eating disorders and addictive behaviours, with an emphasis on experimental psychopathology research.

Eating disorders and addictive behaviours are among the most prevalent disorders in adolescents and young adults: eating disorders primarily in females and addictive behaviours in males. Eating disorders and addictions share some characteristics, like loss of control and craving. For both types of disorders the exact aetiologies are largely unknown, although it has become evident that a range of factors influence an individual's vulnerability to eating disorders and addictions (ranging from genetic to environmental factors). With respect to these vulnerability factors, some may be specific to one of the disorders, but there may also be more general factors (e.g., behavioural disinhibition, impulsivity, sensation seeking) that make an individual more vulnerable to both eating disorders and addictions.

A first aim of this course is to discuss influential theories and empirical papers about the origin or maintenance of eating disorders and addictions. Second, special attention will be paid to experimental psychopathology research methods as an elegant method to test hypotheses on the origin, maintenance or reduction of these disorders. Third, the gap with clinical practice is scrutinised. What is the best treatment a patient can get? And why is it so difficult to implement the evidence-based treatments in clinical practice?

Instructional Approach
Tutorial group meetings, which consist of lectures, group discussions, debates and student presentations.

Form of Assessment
Contribution to the group discussions and debates, writing and presentation of 2 short papers (one scientific, one popular science), writing and presenting a review of another student's work.

PSY4518 479PP Forensic Psychopathology – 2 credits
Coordinator: Corine de Ruiter, Clinical Psychological Science (FPN), Phone 38 84344, 40 Universiteitssingel East, Room 3.744, E-mail: corine.deruiter@maastrichtuniversity.nl

Objective(s)
At the end of this course, students should know:
What types of psychopathology have high prevalence in justice institutions (correctional and forensic mental health settings); how to translate the assessment of the legal construct of criminal responsibility into relevant psychological functions; the pros and cons of different methods of violence risk assessment; what elements are characteristic of effective offender treatment programmes.

Key words
Mental disorder, violence, risk assessment, treatment, legal responsibility.

Description of the Course
A large proportion of individuals who come into contact with the criminal justice system suffer from mental health problems. The diversity of these mental health problems is large: from antisocial personality disorder to paranoid schizophrenia, from Asperger's disorder to paraphilia. In a number of these cases, the mental health system has been unable to serve these individuals, often because of the high levels of co-morbidity, for instance schizophrenia in combination with an Axis II disorder and substance abuse. Forensic psychology is a subspecialty that deals with the interface between psychology and the law, where psychopathology is paramount and complex. In this seminar, recent research on forensic psychopathology will be related to actual cases, including video material. Emphasis will be on the assessment and treatment of mentally disordered offenders, and on the sometimes crucial role the forensic psychologist plays in judicial decision making. In specific, we will pay attention to: the legal concept of criminal responsibility and its assessment; the relationship between Axis I disorders and violence; the relationship between Axis II disorders and violence, with a special emphasis on psychopathy; violence risk assessment by means of structured risk assessment instruments; treatment of offenders: What works.

Instructional Approach
The seminar consists of interactive meetings, including lectures, group discussions, and student presentations.

Form of Assessment
Written paper (systematic review) on a forensic psychology topic and oral presentation with fellow student(s).

PSY4106 406RM Advanced Statistics I – 2 credits

Coordinator: Nick Broers, Methodology and Statistics (FPN) Phone 38 81929, 5 Universiteitssingel, Room 1.014, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: nick.broers@maastrichtuniversity.nl

Objective(s)
Thorough understanding of commonly used advanced statistical methods like ANOVA and regression, and practical skill in applying these with the SPSS software. Elementary understanding of Structural Equations Modelling (SEM) using the Lisrel software.

Key words
Balanced and unbalanced between-subject ANOVA, ANCOVA, MANOVA, multiple regression, discriminant analysis, structural equations modelling (SEM, Lisrel).

Description of the Course

The course consists of six units. In the first four units, participants will be given an in-depth training in the following standard statistical methods: Factorial ANOVA for between-subject designs, analysis of covariance (ANCOVA), multivariate ANOVA (MANOVA), discriminant analysis, and multiple linear regression. Background knowledge of balanced two way factorial ANOVA and multiple regression will be assumed, and these methods will be briefly reviewed. The following advanced topics will then be covered: unbalanced factorial designs, contrast analysis, interaction, nonlinearity, quadratic effects, dummy coding, centering covariates, different coding schemes, collinearity and residuals checks, data transformation. The distinction between confounders and mediators in regression and ANCOVA is also discussed, forming a bridge from regression to structural equations modelling (SEM). The latter is an advanced multivariate method which is gaining importance in psychology but still requires special software (such as Lisrel, EQS, AMOS, or Mplus). SEM is introduced in two units, starting with causal modelling and mediation analysis in cross-sectional research, and then extending this to longitudinal research and latent variables (factors). Special attention is given to model identifiability, model equivalence, global and local goodness of fit indices, parsimony, model modification and cross-validation. Some concepts from matrix algebra are needed for SEM, and these will be briefly discussed without going into technical detail.

Literature

For each unit we will use the handout of the lecture plus a suitable book chapter or article. Details of these will be provided on EleUM. Fox (1997), Howell (2007), and Kleinbaum (1998) give a fair impression of the content and level of the first four units. Mandatory literature for the two units on SEM are the papers by Baron and Kenny (1986) and Diamantopoulos (1994).

References

- Baron, R.M. & Kenny, D.A. (1986). *The moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations*. Journal of Personality and Social Psychology, 51, 1173-1182.
- Diamantopoulos, A. (1994). *Modelling with LISREL: A guide for the uninitiated*. Journal of Marketing Management, 10, 105-136.
- Fox, J. (1997). *Applied regression analysis, linear models, and related methods*. Thousand Oaks (CA): Sage.
- Howell, D.C. (2007). *Statistical methods for psychology* (6th ed.). Belmont (CA): Thomson/ Wadsworth;
- Kleinbaum, D.G., Kupper, L.L., Muller, K.E., & Nizam, A. (1998). *Applied regression analysis and other multivariable methods* (3rd ed.). Pacific Grove (CA): Brooks/Cole.

PSY4116 Practical SPSS

Coordinator: Nick Broers, Methodology and Statistics (FPN) Phone 38 81929,
5 Universiteitssingel, Room 1.014, and Phone 38 82274, 1 P. Debyeplein, Room B2.03
E-mail: nick.broers@maastrichtuniversity.nl

The practical consists of analysis of real data with SPSS, using the methods discussed in the lectures. There will be assignments on balanced twoway ANOVA, unbalanced twoway ANOVA, ANCOVA, multiple linear regression, MANOVA and discriminant analysis. Attention will be given to comparisons between different methods for analyzing the same data, e.g. ANCOVA and regression.

PSY4118 Practical Lisrel

Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001, 5 Universiteitssingel, Room 1.023, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: gerard.vbreukelen@maastrichtuniversity.nl

The practical consists of analysis of real data with Lisrel. The first practical lets the students analyze a cross-sectional study first with multiple regression and then with Lisrel, asking them to compare the two outputs and to look for similarities and differences. The second unit lets them analyze a longitudinal study with Lisrel, asking for a comparison between different models in terms of goodness of fit, parsimony and plausibility.

Each course unit includes a computer practical. The assignment (analysis of real data with SPSS or Lisrel) is discussed in a plenary meeting after the practical. Attendance at practicals and discussion meetings is mandatory (with 100% and 85% attendance rule, respectively).

Instructional Approach

Meetings are arranged into units, consisting of lectures, self tuition, computer exercises, and plenary discussions. There are four units on ANOVA and regression methods, and two units on SEM. Each unit starts with a lecture to explain the purpose of a method and theory and assumptions behind it, and to demonstrate its application to real data. The computer practical then allows students to practice that method themselves and try to interpret the computer output guided by questions in the assignment. The results of the assignment are finally discussed in a plenary meeting.

Form of Assessment

Open book, multiple choice exam consisting of questions resembling the exercises (general theory, some elementary computations, and interpretation of computer output). The exam will consist of 18 three-choice items, 3 items per unit, relating to computer output in appendices.

PSY4107 407RM Advanced Statistics II – 3 credits

Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001, 5 Universiteitssingel, Room 1.023, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: gerard.vbreukelen@maastrichtuniversity.nl

Objective(s)
Thorough understanding of repeated measures ANOVA for within-subject and split-plot (between * within) designs, including factorial designs and covariates in repeated measures ANOVA. Elementary understanding of mixed (= multilevel) regression. Introduction to optimal design and sample size calculation.

Key words
Oneway within-subject design, multivariate versus univariate method of analysis, sphericity, epsilon adjustment, two-way within-subject design, split-plot (between*within) design, covariates In repeated measures, mixed regression, marginal models, random intercept, random slope, within-subject covariates, missing data, optimal design, sample size, power.

Description of the Course
The course consists of seven units. The first three units cover the classical repeated measures ANOVA methods for the one- and twoway within-subject design and the split-plot (between* within) design. Special attention is given to the following topics: The choice between multivariate and univariate data format and method of analysis, and the sphericity assumption and epsilon correction for violation of it. The distinction between the within-subjects and between-subjects part of a split-plot ANOVA, and how to obtain both using regression analysis on differences and averages of repeated measures. The surprising consequences of including covariates into repeated measures ANOVA. The choice between different methods of analysis for randomized trials versus for nonrandomized group comparisons. Subsequently, three units are devoted to mixed (multilevel) linear regression for nested designs and longitudinal studies. This part starts with a unit on so-called marginal models for repeated measures as an alternative to repeated measures ANOVA in case of missing data or within-subject covariates, showing the pros and cons of various models that can be chosen for the correlational structure of repeated measures, such as compound symmetry, AR1 and unstructured. Another unit introduces the random intercept and random slope model for repeated measures as a method for investigating interindividual differences in average and trend in growth curves (longitudinal research) or time series (single trial analysis of lab experiments). The last unit on mixed regression shows the use of such random effects models for the analysis of nested designs, e.g. cluster randomized trials on a sample of at least 10 schools, or general practices or companies (with pupils, patients, or employees nested within organizations). Finally, the topic of optimal design, sample size and power is introduced in a seventh unit.

Literature
For each unit we will use the handout of the lecture plus a suitable book chapter or article. Details of these will be provided on EleUM.
For units 3 (covariates in repeated measures designs) and 6 (nested designs), the following literature will be used:
- Moerbeek, M., Van Breukelen, G.J.P., & Berger, M.P.F. (2003). *A comparison between traditional methods and multilevel regression for the analysis of multicenter*

intervention studies. Journal of Clinical Epidemiology, 56, 341-350.
- Van Breukelen, G.J.P. (2006). *ANCOVA versus change from baseline: more power in randomized studies, more bias in nonrandomized studies*. Journal of Clinical Epidemiology, 59, 920-925.
- Van Breukelen, G.J.P., & Van Dijk, K.R.A. (2007). *Use of covariates in randomized controlled trials*. Journal of the International Neuropsychological Society, 13, 903-904.

PSY4117 Practical SPSS
Coordinator: Gerard van Breukelen, Methodology and Statistics (FPN) Phone 38 84001, 5 Universiteitssingel, Room 1.023, and Phone 38 82274, 1 P. Debyeplein, Room B2.03, E-mail: gerard.vbreukelen@maastrichtuniversity.nl

The practical consists of analysis of real data with SPSS, using the methods discussed in the lectures. There will be assignments on one- and twoway within-subject ANOVA, split-plot ANOVA without and with a covariate, marginal modelling of repeated measures without and with missing data, random effects modelling of repeated measures, random effects modelling of nested designs. Much attention will be given to comparisons between the results of different methods for the same data, such as repeated measures ANOVA versus regression analysis of pretest-posttest control group designs, and repeated measures ANOVA versus mixed regression of longitudinal studies with missing data.

Each course unit includes a computer practical. The assignment (analysis of real data with SPSS) is discussed in a plenary meeting after the practical.

Instructional Approach
Meetings are arranged into units, consisting of lectures, self tuition, computer exercises, and plenary discussions. There are three units on repeated measures ANOVA including covariates, three on mixed regression, and one on optimal design and sample size. Each unit starts with a lecture to explain the purpose of a method and theory and assumptions behind it, and to demonstrate its application to real data. The computer practical then allows students to practice that method themselves and try to interpret the computer output guided by questions in the assignment. The results of the assignment are finally discussed in a plenary meeting.

Form of Assessment
Open book, multiple choice exam consisting of questions resembling the exercises (general theory, some elementary computations, and interpretation of computer output).The exam will consist of multiple choice items, relating to computer output in appendices.

PSY5511 571PP Personality Disorders – 3 credits
Coordinator: David Bernstein, Clinical Psychological Science (FPN), Phone 38 81483, 40 Universiteitssingel, Room 5.742, E-mail: d.bernstein@maastrichtuniversity.nl

Objective(s)
Become familiar with the phenomenology of the DSM-IV personality disorders; acquire understanding about the major theories of personality disorders; critically analyze the research evidence relating to personality disorders.

Key words
Personality disorders, DSM-IV, Axis II, classification, etiology, epidemiology, treatment.

Description of the Course
This seminar aims to give the student a state-of-the-art overview of theories, classification issues, and treatment models of personality disorders, with an emphasis on current scientific debate on these issues.

Topics
Topics include personality theories relating to personality disorders; biological models of personality disorders (including genetic and neurotransmitter models); psychological models of personality disorders (modern psychodynamic, conditioning, cognitive, interpersonal, integrative models); sociological perspectives on personality disorders; classifications issues (DSM-IV diagnosis; axis-1 vs. axis-2; categorical vs. dimensional models; polythetic definition; diagnostical techniques); etiological issues; epidemiological issues; treatment options.

Literature
The basic text for this course is Millon, T. et al. (2004). *Personality Disorders in Modern Life* (2nd ed). New York: Wiley.
Additional readings via EleUM.

Instructional Approach
The seminar consists of interactive meetings, including lectures and group discussions.

Form of Assessment
Written exam with open questions.

PSY5512 572PP Mental Health and Happiness – 3 credits
Coordinator: Madelon Peters, Clinical Psychological Science (FPN), Phone 38 81603, 40 Universiteitssingel East, Room 5.732a, E-mail: madelon.peters@maastrichtuniversity.nl

Objective(s)
To familiarize students with the concepts and ideas of positive psychology.

Key words
Positive psychology, happiness, mental health, resilience.

Description of the Course
To close the Psychopathology core course trajectory, this course will familiarize students with concepts and ideas from what is sometimes called 'positive psychology'. Positive psychology was introduced by Martin Seligman around 2000 and can be viewed as a supplementary approach to clinical psychology. The positive psychological movement formulated three aims: (1) to focus on well-being and happiness instead of abnormal behaviour and psychopathology; (2) to be concerned with building positive qualities and strengths instead of repairing damage; (3) to prevent future problems instead of correcting past and present problems.

The course will start with a general introduction to the field of positive psychology. The main concepts will be introduced and clarified, and an overview of the results of happiness studies will be presented. In subsequent meetings, various more specific topics will be discussed by means of lectures and group discussions. These topics include: positive psychology and physical health, resilience and positive personality traits, trauma and personal growth, positive psychotherapy and resilience-building Interventions. Students can gain more in depth knowledge on a topic of choice through their research paper. In the closing session, the value of positive psychology as an addition to more traditional clinical psychological approaches will be discussed.

Literature
Journal articles, available via EleUM.

Instructional Approach
The seminar consists of interactive meetings, including lectures, group discussions, and student presentations.

Form of Assessment
Research proposal.

5.4 Skills training

PSY4531 481PP Research Practicum Psychometrics – 2 credits
Coordinator: Jeffrey Roelofs, Clinical Psychological Science (FPN), Phone 38 81607, 40 Universiteitssingel East, Room 3.757, E-mail: J.Roelofs@maastrichtuniversity.nl

Objective(s)
To become acquainted with evaluating psychometric aspects of self-report questionnaires. The aim is to explore psychometric properties (e.g., factor analysis, reliability, and validity) of questionnaires using "real" data within the field of psychopathology.

Key words
Factor analysis, psychometrics, reliability, validity.

Description of the Course
This training will focus on giving students hands-on experience with the application of psychometrics. Topics that are covered include factor analysis (both exploratory and confirmatory), reliability analysis (e.g., Internal consistency, test-retest stability), and indices of validity (e.g., construct validity, predictive validity). Beyond the primary goal of learning more about how to evaluate and improve the psychometric properties of research instruments, students will also become acquainted with current research on psychopathology being conducted by senior staff, post-docs, and PhD students at the UM.

Instructional Approach
Students will work together in small groups on psychometric analyses of existing research datasets, supervised by one faculty member. In addition to scheduled lectures and discussions with experts in psychometrics, students will have the opportunity to consult a statistician for their analyses.

Literature
A good source is the textbook *Using Multivariate Statistics* by Tabachnick & Fidell (2001). A book chapter on psychometrics by Tyron & Bernstein will be available online.

Form of Assessment
Attendance at required sessions, contribution to analyses, final written report.

PSY4532 482PP Clinical Skills I: Interviewing Skills – 2 credits
Coordinator: Inge Drost, Clinical Psychological Science (FPN), Phone 38 81733, 40 Universiteitssingel East, Room 5.731a, E-mail: inge.drost@maastrichtuniverstity.nl

Objective(s)
The aim of this training is to teach students basic clinical interview skills needed for interviewing patients with psychopathology. After this training, students should be able to administer semi-structured interviews covering the reason for referral, chief complaint and history of the presented problem(s), mental status, developmental and social assessment, diagnoses, and type of treatment requested.

Key words
Interviewing skills, psychopathology, assessment.

Description of the Course
The aim of this training is to teach students basic clinical interview skills needed for interviewing patients with psychopathology. After this training, students should be able to administer semi-structured interviews covering the reason for referral, chief

complaint and history of the presented problem(s), mental status, developmental and social assessment, diagnoses, and type of treatment requested.

Literature
Morrison, J. (2008). *The First Interview* (3rd ed). New York: Guilford Press.

Instructional Approach

This course consists of seven 2-hour sessions. The first meeting is an introductory lecture. The second meeting will be an SPC (Simulated Patient Contact), during which the entrance level of each student will be assessed. The other meetings are structured as training meetings; as preparation, students study literature and video material on dvd. The assessment skills are practiced by means of role-playing. The last meeting will again be an SPC. Students complete an assessment and a reflection report for each SPC.

Form of Assessment
Adequate demonstration of interviewing skills, adequate completion of patient assessment reports and reflection reports.

PSY4533 483PP Clinical Skills II: Diagnostic Test Procedures – 2 credits
Coordinator: Rudolf Ponds, Psychiatry and Neuropsychology (FHML),12 Dr. Tanslaan, Room 4.G3.061, Phone 38 76044, E-mail: r.ponds@np.unimaas.nl

Objective(s)
To teach students procedures for psychodiagnostic and neuropsychological testing needed for assessing type, severity and extent of psychopathology and neuropsychological problems in individuals with psychiatric disorders.

Key words
Clinical skill training, psychodiagnostic and neuropsychological testing, interview techniques, test administration

Description of the Course
Students will learn to administer a psychodiagnostic interview in adult clients with psychiatric diagnoses as well as in caregivers of children with developmental problems. Also, they will extend their experience in neuropsychological test administration and observation. They will acquire skills in writing a formal report and in communicating their conclusions to the patient.

Following an introduction to the main cognitive domains in relation to brain areas and relevant neuropsychological and psychopathological test procedures, the training will focus on five disorders: developmental disorders (including disorders of executive functioning and disorders of learning and attention), schizophrenia, bipolar disorder, depression, and personality functioning. These conditions will be discussed in relation to the principles of assessment of psychopathology and neuropsychology outlined in

the first session. Students will practice their interviewing skills in real client interviews. In addition, students will be trained in neuropsychological history taking and test administration.

Literature
Book chapters in the field of neuropsychology and neuropsychiatry.

Instructional Approach
The seven 2-hour sessions will consist of introductory lectures, plenary discussions, and interviews of different patients or caregivers of children. In addition, students will perform a neuropsychological examination on a fellow student.

Form of Assessment
Observation of students' behaviour and written reports.

PSY4108 408RM Neuroanatomy – 1 credit
Coordinator: Jos Prickaerts, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 81168, 50 Universiteitssingel, Room 1.110, E-mail: jos.prickaerts@maastrichtuniversity.nl

Objective(s)
To become acquainted with the neuroanatomical terminology and to gain insight into the spatial and functional organization of the brain.

Key words
Neuroanatomy, limbic system, basal ganglia.

Description of the Course
The aim of the training is to become acquainted with the neuroanatomical terminology and to gain insight into the spatial and functional organization of the brain. It is essential to have a basic knowledge of the brain anatomy when working in the field of neuropsychology or neurobiology. Many specific brain areas can be linked to particular functions. Thus, knowledge of the brain anatomy and its main functions allows one to directly link specific neurological or psychiatric disorders to particular brain areas. After a short theoretical introduction the students will study whole brains and brain material of mammals at both macroscopical (visual inspection) and microscopical level. The emphasis will be on major brain systems including the basal ganglia and limbic system.

Instructional Approach
Almost exclusively practical: dissection of sheep brain, studying of microscopical slices of rat brain, working with plastic human brain models, CD-ROM programs and textbook.

Form of Assessment
Pass/fail score based on written exam with open questions.

PSY4422 485PP Psychophysiological Skills – 1 credit

Coordinators: Pascal van Gerven, Neuropsychology and Psychopharmacology (FPN), Phone 38 84512, 40 Universiteitssingel East, Room 2.742, E-mail: p.vangerven@maastrichtuniversity.nl; Eric Vuurman, Neuropsychology and Psychopharmacology (FPN), Phone 38 81046, 40 Universiteitssingel East, Room 2.747, E-mail: e.vuurman@maastrichtuniversity.nl

Objective(s)
To acquire basic, generic skills in psychophysiology.

Key words
Peripheral psychophysiology, methodology.

Description of the Course
The goal of this training is to acquire basic skills in major peripheral psychophysiological measures. The relation between cognitive and psychophysiological variables, such as memory load, mental effort, and attention, will be made clear. In addition, general methodological concepts and issues, such as tonic (baseline) activity, phasic activity, and the so-called "law of initial value", will be discussed.

The training consists of four meetings. In the first meeting, an overview will be presented of the psychophysiological methods that are relevant to both experimental clinical psychology and neuropsychology. The second meeting is devoted to major domains in psychophysiology, such as heart rate (variability), blood pressure, galvanic skin responses, and pupillometry (i.e., pupil dilation). In this meeting, students acquire basic hands-on experience in the laboratory. The third and fourth meeting are practical sessions, in which an existing dataset will be provided to analyze and report on.

Instructional Approach
Lecture, demonstrations, practical sessions.

Form of Assessment
Short written research report.

PSY4534 486PP Clinical Assessment Instruments – 2 credits

Coordinator: Jill Lobbestael, Clinical Psychological Science (FPN), Phone 38 81611, 40 Universiteitssingel East, Room 5.741 E-mail: jill.lobbestael@maastrichtuniversity.nl

Objective(s)
To become acquainted with the dominant psychological assessment methods, as used in clinical practice and research on the various forms of psychopathology

Key words
Assessment, psychodiagnostics, questionnaires, interview, tests.

Description of the Course
Running parallel to the core seminars throughout year 1, a series of training sessions will familiarize students with the range of rating scales, questionnaires, and interview instruments most commonly used in clinical practice and research. The first session will provide an overview of the classes of available instruments and their applications in clinical and research contexts. Later sessions will focus on instruments designed to assess specific symptoms and severity of the disorders covered in the current core seminar. The last sessions will focus on broader measures of personality, psychopathology and adjustment (e.g., MMPI, SCL-90, quality of life, social adjustment and coping scales). Working with case materials, students will learn how to choose appropriate assessment instruments for clarifying individual diagnoses, planning interventions, and monitoring their effects. These training sessions will give students basic background information and hands-on experience in valid and reliable instruments for assessing psychopathology.

Instructional Approach
Group discussions, lectures, demonstrations, practical training.

Form of Assessment
Completion of in-class assignments.

PSY5531 581PP Clinical Skills III: Clinical Interview for the DSM IV (SCID I and SCID II) – 1 credit

Coordinator: Reinier Kreutzkamp, Clinical Psychological Science (FPN), Phone 38 81605, 40 Universiteitssingel East, Room 5.731, E-mail: r.kreutzkamp@maastrichtuniversity.nl

Objective(s)
To acquire experience in doing standardised interviews concerning psychopathology, more specifically in the structured clinical interview for the DSM IV-tr (SCID I and SCID II).

Key words
Standardised interview, psychiatric classification, judging behavioural criteria.

Description of the Course
The aim of this training is to teach students how to conduct the semi-structured clinical interview for the DSM-IV-Tr Axis I (SCID I) and Axis II (SCID II) diagnoses. Students will learn to interpret the outcome of these interviews, to establish differential diagnoses, and to summarize findings in a written report.

Instructional Approach
Four 2-3 hour practical sessions and demonstrations.

Form of Assessment
Students' skills in the above areas will be assessed on the basis of observation of their interview behaviour as well as on their written reports.

PSY5522 582PP Clinical Skills IV: Intervention Techniques – 1 credit

Coordinator: Marisol Voncken, Clinical Psychological Science (FPN), Phone 38 81253,
40 Universiteitssingel East, Room, 3.757, E-mail: m.voncken@maastrichtuniversity.nl

Objective(s)
The aim of this training is to teach students some of the basics of CBT for relatively simple forms of psychopathology. This training will focus on main elements of CBT, that is, 1) making a case conceptualization of a case, 2) explaining the rationale of exposure therapy, 3) applying exposure, 4) explaining the rationale of cognitive therapy and 5) applying cognitive techniques. After this training students should be able to carry out some elementary therapeutic procedures.

Key words
Therapeutic skills, cognitive behavioural treatment, CBT, functional analysis, exposure, cognitive techniques.

Description of the Course
Cognitive behavioural therapy (CBT) is a widely used treatment regimen that is seen as the evidence-based treatment for various psychopathological disorders such as anxiety disorders and depression. The behavioural component, exposure, was developed in the sixties by researchers like Skinner and was considered a breakthrough for specific phobias and obsessive-compulsive disorder. These disorders were seen as untreatable at that time. In the eighties the cognitive component started to develop. Aaron Beck, in those days trained as a psychoanalytic therapist, was able to treat depression within a few months with his cognitive approach. This was also a breakthrough, as psychoanalytic treatments for depression at that time normally took years. Researchers and therapists started to combine the behavioural and cognitive techniques, resulting in cognitive behavioural therapy. Over the years many studies have shown the effectiveness of this treatment, and in the Netherlands CBT is included in the official professional guidelines for treatment of anxiety disorders and depression.

Literature
Roth Ledley, D., Marx, B.P., & Heimberg, R.G. (2005). *Making cognitive-behavioural therapy work*. New York: The Guilford Press.

Instructional Approach
Four 3-hour sessions. In this training, demonstrations and role-play will be used. Each of the students will 'treat' one case, which is role-played by another student. The students apply the different techniques on this role-played case. First the instructor demonstrates each of the techniques. Subsequently, each of the students will apply

these techniques on his/her role-played case. Last, students write out a verbatim of each of the therapy sessions. In addition to treating their role-played case, student will apply some of the techniques to their own mild fears.

Form of Assessment
The coordinator will evaluate the individual verbatim of the therapy sessions.

5.5 M&T workshop

PSY4541 491PP Ecological Psychiatry – 1 credit

Coordinators: Philippe Delespaul, Psychiatry and Neuropsychology (FHML), Phone 36 88666, Vijverdal, Room SN2.069, E-mail: ph.delespaul@sp.unimaas.nl; Inez Myin-Germeys, Psychiatry and Neuropsychology (FHML), Phone 36 88683, Vijverdal, Room SN2.067, E-mail: i.germeys@sp.unimaas.nl

Objective(s)
To introduce the field of ecological psychiatry with its scientific roots; to explore and discuss the methodological and statistical challenges related to research with self-reports in normal daily situations; to illustrate the applicability of these research methodologies in basic and applied clinical research (using schizophrenia research as the primary reference).

Key words
Assessment, ecological psychiatry, Experience Sampling Method, psychopathology, stress, coping.

Description of the Course
The expression of psychiatric symptoms is reflected in an individual's behaviours and private phenomena such as thoughts, perceptions and emotions. Psychiatric deficits reveal themselves in the ongoing interplay between the patient and the everyday environment, unavailable for direct observations by the clinician. Therefore, crucial diagnostic information has to come from recollections by the patients. Unfortunately, these self-observations are not reliable. To ascertain reliable data, self-ratings should be collected prospectively in the normal daily life ('ecological validity').

During the course, the students will be challenged to develop an assessment for person-environment interactions in real-life situations, thus exploring the possibilities and problems associated with ecological research. Next, Experience Sampling, a specific method within the field of ecological psychiatry, will be introduced. Finally, students will be asked to apply this method to a specific research question.

Literature
Journal articles and book chapters.

Instructional Approach
The workshop will mainly consist of self-exploration in small groups, combined with traditional teaching and group discussions.

Form of Assessment
Completion of two assignments, performed in small groups.

PSY4542 492PP The Application of Cognitive Methods in Psychopathology Research – 1 credit

Coordinator: Anne Roefs, Clinical Psychological Science (FPN), Phone 38 82191, 40 Universiteitssingel East, Room 3.747, E-mail: a.roefs@maastrichtuniversity.nl

Objective(s)
At the end of the workshop, students are expected to: have knowledge of cognitive paradigms that are often applied in psychopathology research; know how to set-up a basic reaction time (RT) experiment; be able to evaluate research in which RT experiments are done; be able to look critically at an RT experiment.

Key words
Cognitive psychology, response latencies, experiments.

Description of the Course
The goal of this workshop is to introduce the students to the most important paradigms from cognitive psychology that are often used in psychopathology research to study biased cognitive processing. Biased cognitive processes play an important role in many kinds of psychopathology, such as depression, anxiety disorders, and eating disorders. The most intensively studied processes involve attention, memory, interpretation, and associations. To study these processes, experimental paradigms from cognitive psychology have been adapted to the needs of clinical psychology. Most of these experimental tasks involve the measurement of reaction times. Unlike other techniques (e.g., eye-tracking, fMRI, EEG), they are easy to program and often run on a standard PC. This workshop will introduce the students to the most popular tasks in the areas of attention (emotional Stroop task, dot probe task, visual search paradigm), memory, interpretation, and associations (Implicit Association Test, (extrinsic) affective Simon Task, affective priming paradigm). At the end of this course, students should know the pros and cons of each task well enough to choose an appropriate task for a given research question, and they should be able to change the features of the chosen task to fit their own research needs.

Instructional Approach
In the course, students are given a number of introductory papers about the tasks. In two lectures, the various paradigms are explained and briefly demonstrated, and applications in several forms of psychopathology are discussed. An important aspect of the lectures will be a discussion of the pros and cons of the various paradigms.

Students also take part in a short practicum, consisting of three meetings. During these practical sessions they will work with PsychMate, a program that is especially designed to acquaint students with various computerized paradigms from cognitive and social psychology. Students will work in groups of two.

Form of Assessment
Short practical assignments and a paper.

PSY4431 493PP Research Theory and Designs – 1 credit

Coordinator: Arnoud Arntz, Clinical Psychological Science (FPN), Phone 38 81228,
40 Universiteitssingel East, Room 5.735, E-mail: arnoud.arntz@maastrichtuniversity.nl

Objective(s)
To learn about the possibilities and impossibilities of different methodologies and design types frequently used in the field of psychopathology,
with a specific focus on explorative vs. hypothesis-testing research, and the possibility to make causal inferences.

Key words
Methodology, (experimental) design, correlational design, longitudinal design, qualitative research, case series design.

Description of the Course
The aim of the workshop is to provide students a good understanding of the theoretical and practical issues of different designs that are used in the domain of psychopathology.

This workshop will elaborate on basic issues of theory and methodology of scientific research in the field of psychopathology. The first session is devoted to qualitative research methods and advanced small-scaled case series designs. The second session will focus on experimental designs to test causal hypotheses derived from theories of psychopathology. The third session will cover advanced correlational designs, including prospective designs, with special reflection on the issue to what degree such designs can determine causality. The last session deals with the design of treatment outcome studies, focusing mainly on randomized clinical trials.

Literature
Journal articles providing examples and explanations of different types of designs.

Instructional Approach
Interactive discussions under the leadership of research faculty with special interest in the topic.

Form of Assessment
Exam with open questions.

PSY4109 409RM Research Ethics – 1 credit
Coordinator: Eef Theunissen, Neuropsychology and Psychopharmacology (FPN),
Phone 38 81940, 40 Universiteitssingel East, Room 2.743,

E-mail: e.theunissen@maastrichtuniversity.nl

Objective(s)
To critically examine ethical issues and to learn about ethical and legal regulations in research.

Key words
Ethics, legal, guidelines.

Description of the Course
Students will learn to think critically about ethical dilemmas that psychologists encounter when exercising their profession. This workshop will discuss legal and ethical conflicts that are involved in psychological research and clinical practice. Students will be introduced to the ethical and legal rules and boundaries in human research, and to the organizations and institutes supervising the application of these rules.

Psychologists always need to make sure that they carry out their work in an ethical and legally sound way. However, there is often a conflict of interests of the involved parties. In all circumstances, however, it is the psychologist's primary task to secure the patients/participants welfare and to keep risks at a minimum. Therefore psychologists should know which ethical aspects are of importance and which laws and rules need to be applied and also which institutions supervise on the application of these rules. In addition, these aspects should be taken into consideration when writing and submitting a research proposal to an ethical commission.
The following topics will be discussed:
- Examples of ethical and legal failings
- Necessity of ethical and legal rules
- Different guidelines: declaration of Helsinki, guidelines for Good Clinical Practice, etc.
- Working with participants/patients: rights and duties, confidentiality, data processing and storage, etc.
- Applying ethical and legal rules in e.g., protocol, case report form, informed consent, etc.
- Ethical and legal reviews.

Literature
Links to relevant literature on EleUM.

Instructional Approach
Lectures and discussion groups.

Form of Assessment
Presentation.

PSY4333 496PP Epidemiology – 1 credit

Coordinator: Marcus Huibers, Clinical Psychological Science (FPN), Phone 38 81487, 40 Universiteitssingel East, Room 5.750, E-mail: m.huibers@maastrichtuniversity.nl

Objective(s)
To get acquainted with the principles of epidemiological research.

Key words
Epidemiology, methodology, research designs.

Description of the Course
Epidemiology often is referred to as "quantitative medicine". In general, epidemiology deals with methodology issues in the field of health research, including mental health. Students in this workshop will be introduced to the principles of epidemiological research. Topics that are covered in the workshop include: frequency measures, association measures, sources of bias, validity issues, cohort studies, clinical trials, and systematic reviews. The theory of epidemiology will be studied and applied in interactive workshop sessions.

Literature
Required reading will consist of several chapters from a clinical epidemiology textbook and additional research papers combined in an e-reader. In addition to the workshops sessions, students are expected to spend 5 hours a week on reading and homework assignments.

Instructional Approach
Format of the workshop is a series of four 2-hour sessions and a fifth presentation session. Starting each session, the lecturer will give a 30-minute presentation of the topics covered in that session, followed by a 30-minute discussion of these topics. The second hour will be spent on group assignments under supervision of the lecturer.

Form of Assessment
Group assignment: During the entire workshop, students will work on a research proposal in groups of three. Students will prepare the proposal during the sessions; the remainder of the work is part of the homework assignments. The groups will give a 10-minute presentation of their proposals in a final session. Members from the other groups will act as the jury. Based on the presentations and feedback, the lecturer will give the final assessment (fail or pass).

PSY4334 497PP Imaging – 2 credits

Coordinator: Vincent van de Ven, Cognitive Neuroscience (FPN), Phone 38 84510, 40 Universiteitssingel East, Room 4.761, E-mail: v.vandeven@maastrichtuniversity.nl

Objective(s)
Introducing the basic principles of the most common imaging methods, and critical assessment of these methods in studying human brain functions and dysfunctions.

Key words
Magnetic resonance imaging (MRI), functional MRI, structural MRI, positron emission tomography (PET), neuroimaging.

Description of the Course
This workshop is intended to provide:
- introductory knowledge of the basic principles underlying the most common imaging methods;
- appreciation of potentialities and limitations of various neuroimaging methods in studying human brain functions and dysfunctions.

The investigation of human brain anatomy and functions using a range of imaging methods represents the most influential development in Psychology in the last years. In this workshop, essential facts about contemporary major structural and brain mapping techniques, including Positron Emission Tomography (PET), structural and functional Magnetic Resonance Imaging (fMRI) will be reviewed. The focus will be on the strengths and weaknesses of each of these methods and on the description of relevant applications in the normal and pathological brain. These topics will be further investigated through lectures and paper discussions.

Literature
Selected papers which will be made available prior to the start of the course.

Instructional Approach
Lectures, paper discussion, demonstration visit to the MRI scanner.

Form of Assessment
Paper assignment: Preparing a research proposal.

PSY4335 498PP Psychopharmacology – 1 credit

Coordinator: Wim Riedel, Neuropsychology and Psychopharmacology (FPN), Phone 38 84322, 40 Universiteitssingel East, Room 2.777a, E-mail: w.riedel@maastrichtuniversity.nl

Objective(s)
Getting familiarized with current research topics in Psychopharmacology; learning to know the drivers and applications; i.e. neuropsychiatric disease understanding and how this relates to development of new drugs.

Key words
Pharmacology, genetics, physiological psychology, experimental neuropsychology, biological psychiatry, drug development, biomarkers.

Description of the Course
The workshop aims to present Psychopharmacology in a broad sense. The multidisciplinary nature of psychopharmacology encompasses pharmacology, molecular biology, genetics, physiological psychology, experimental, clinical and cognitive neuropsychology and biological psychiatry. The emphasis will be on understanding drug development, drug action, drug research, animal and human pharmacological models of clinical disorders, experimental / clinical trial design and the development of biomarkers, real measures and surrogate measures of drug efficacy. The course will focus on major areas in Psychopharmacology such as Addiction, Depression, Anxiety, Psychosis and Cognition. These areas will be illuminated form both the perspectives of basic neuroscience including animal subjects as well as experimental and clinical human psychopharmacology.

Instructional Approach
Each half-day the programme will consist of a sequence of three elements:
- Key note Lectures by internationally renowned speakers in the morning
- Presentations of recent research by PhD students or junior researchers
- Forum report by students about the poster-presentations

The workshop offers plenty of opportunity for the Master's student to interact with PhD students, junior and senior staff and the invited guest speakers.

Form of Assessment
Short presentation in the forum discussion.

PSY4543 499PP Sexual Disorders – (Elective) 1 credit
Coordinator: Jacques van Lankveld, Clinical Psychological Science (FPN), Phone: 38 81047, 40 Universiteitssingel East, Room 3.738, E-mail: J.vanLankveld@maastrichtuniversity.nl

Objective(s)
To increase students' knowledge and comprehension of selected key topics in sex research, with an emphasis on the cognitive and behavioural mechanisms that play a role in the etiology and maintenance of sexual dysfunction

Key words
Sex research, sexual dysfunction, cognitive mechanisms.

Description of the Course
The workshop introduces the student to key concepts in current research in sexology, with an emphasis on the cognitive and behavioural mechanisms that play a role in the etiology and maintenance of sexual dysfunction.

Topics
Topics include: the biopsychosocial model of sexual functioning, including the subjective, physiological, and relational dimensions of sexual functioning; Gender differences in sexual functioning; The role of cognitive errors in attribution and expectancy; The role of attention and affect; An overview of sexual disorders; Cognitive-behavioural treatments of sexual disorders.

Literature
Book chapters and journal articles available on EleUM.

Instructional Approach
Introductory lecture, group discussion and presentations.

Form of Assessment
Discussion paper and presentation.

PSY5106 500PP Case Studies and Single-Case Designs – (Elective) 3 credits
Coordinator: Patrick Onghena, Department of Psychology (University of Leuven), Phone 0032 16 326100, 102 Tiensestraat, Belgium.E-mail: Patrick.Onghena@ped.kuleuven.be

Objective(s)
To provide the students with knowledge, insight and competence in the methodology of case study and single-case research. After taking this course, students should be able to read scientific publications on case studies and single-case designs in a critical manner, with focus on the procedural and technical details. They should also be able to independently set up and carry out a case study or single-case experiment, to analyze and interpret the data, and to report on it. This course has the explicit intention to bridge the gap between theory and practice, and between so-called qualitative and so-called quantitative methods.

Key words
Case studies, single-case experiments, statistics, research designs, clinical research.

Description of the Course
This course consists of three parts.
In the first part, the uniqueness of idiographic research is elucidated, together with the

different points of view one can hold regarding to idiographic research.
The second part elaborates on the advantages and disadvantages of case studies, observational single-case research (time series research) and experimental single-case research (N-of-1 experiments). Furthermore, the type of research questions for which these designs are suitable, and the validity criteria that should be taken into consideration, are discussed. The methodological principles are illustrated in each case by scientific publications reporting on case studies and single-case designs.
In the third part, it is explained how case studies and single-case designs can be conducted in actual practice. Attention is given successively to: (1) problem formulation, (2) planning and design of the study, (3) gathering information, observations and measurements, (4) data processing and interpretation, and (5) reporting and dissemination. Finally, it is indicated how case studies and single-case research can be combined with one another as well as with group research (e.g. 'breadth' research in the form of a traditional survey, complemented with 'indepth' case studies).

The course will be given at KU Leuven and is also open to KUL Master's students. Train transportation will be arranged.

Instructional Approach
Five 3-hour sessions.

Form of Assessment
Written paper, based on an individually conducted case study or single-case design.

PSY5101 501RM Advanced Academic Writing – 2 credits
Coordinator: Caroline van Heugten, Neuropsychology and Psychopharmacology (FPN) and Psychiatry and Neuropsychology (FHML), Phone 38 84091, 12 Dr. Tanslaan, Room 4.E3.017, E-mail: c.vanheugten@maastrichuniversity.nl

Objective(s)
The goals of the course are to familiarize the Research Master's students with the academic writing process involving research protocols, grant proposals, scientific papers and posters. A variety of academic writing skills will be practiced.

Key words
Writing skills, research protocol, author guidelines.

Description of the Course
During this course, students will be familiarized with the different phases of writing scientific products, such as research protocols, scientific publications, grant proposals and scientific posters. In advance of their upcoming career as a scientist and in the nearby future their masters thesis, they will learn to define and crystallize a research question based on its feasibility and scientific relevance; to prepare and structure their arguments and to plan the different parts of the paper; to think about suitable designs

and research methods for data acquisition and analysis, and, finally, to learn how to walk through the writing process starting from draft to the final version. The student will get acquainted with the competitive nature of academic writing in an exercise environment. This all will be accomplished by competence-based learning in which they have to integrate factual knowledge (from the literature) into skill-based practice (by exercise).

Instructional Approach
A combination of lectures, take home writing assignments and take home review assignments, a workgroup meeting with poster presentations.

Form of Assessment
A positive evaluation of this workshop is based on:
- attendance at the lectures;
- fulfilling all take-home writing and review assignments;
- writing a final research proposal of sufficient quality (introduction/theoretical background and method/workplan); feedback about the proposal will be given on an individual level;
- presenting a poster.

5.6 Internships

PSY5102 502RM Research internship and PSY5103 Master's thesis – 30 credits

Coordinator: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 82181, 40 Universiteitssingel East, Room 2.755, E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
Conduct an empirical research project under supervision resulting in a thesis.

Key words
Internship, research, Master's thesis.

Description of the internship
The second part of the 2nd year of the Research Master's programme is devoted to arranging and conducting a research internship. As a result of the many international research contacts our faculty members have established, a substantial number of students will conduct their research internship abroad. Students finalize the Master's programme by writing a thesis on their internship.

The internship can be done at Maastricht University or at external research institutes. In all cases, two assessors will evaluate the research proposal and Master's thesis. At

least one assessor has to be a member of the Faculty of Psychology and Neuroscience (FPN) or the Faculty of Health, Medicine and Life Sciences (FHML). The other assessor might be a (senior) researcher at, for example, the institute where the data are collected.
A detailed guide on research internships and Master's thesis can be found on EleUM > Students Research Master Faculty of Psychology and Neuroscience > internships.

Form of Assessment
PP students conduct both a research and a clinical internship (see Clinical internship and Minor's thesis below). For PP, the research internship will therefore be assigned 30 credits: 20 for the practical activities and research proposal (pass/fail) and 10 for the Master's thesis (graded).

For more information about research internships contact the general coordinator or go directly to the internship contact of the specific specialization programme:

General Coordinator Internships: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 82181, 40 Universiteitssingel East, Room 2.755, E-mail: bart.scholtissen@maastrichtuniversity.nl

Psychopathology: Nancy Nicolson, Psychiatry and Neuropsychology (FHML), Phone 36 88684, Vijverdal, Room SN2.068, E-mail: n.nicolson@sp.unimaas.nl

PSY5104 503RM Clinical internship and PSY5105 Minor's thesis – 20 credits

Coordinator: Bart Scholtissen, Neuropsychology and Psychopharmacology (FPN), Phone 38 82181, 40 Universiteitssingel East, Room 2.755, E-mail: bart.scholtissen@maastrichtuniversity.nl

Objective(s)
Direct experience of the work environment of the clinical psychologist. Training of clinical skills in real-life situation.

Key words
Clinical practice, clinical training, clinical research, psychodiagnostic investigation, patient contact.

Description of the internship
Students who are specializing in Psychopathology are required 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 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 organization and practice of mental health care, as well as basic experience in clinical diagnosis and therapeutic interventions.

A detailed guide on clinical internships and Minor's thesis can be found on EleUM > Students Research Master Faculty of Psychology and Neuroscience. Although not required to do so by 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 2 weeks.

Form of Assessment
The clinical internship and Minor's thesis will together be assigned 20 credits: 16 credits for clinical activities and clinical research proposal (pass/fail assessment) and 4 credits for the Minor's thesis (graded assessment)

For more information about clinical internships, contact the general coordinator or go directly to the internship contact of the specific specialization programme:

General Coordinator Internships: Bart Scholtissen, Phone 38 82181, 40 Universiteitssingel East, Room 2.755, E-mail: bart.scholtissen@maastrichtuniversity.nl

Psychopathology: Nancy Nicolson, Psychiatry and Neuropsychology (FHML), Phone 36 88684, Vijverdal, Room SN2.068, E-mail: n.nicolson@sp.unimaas.nl

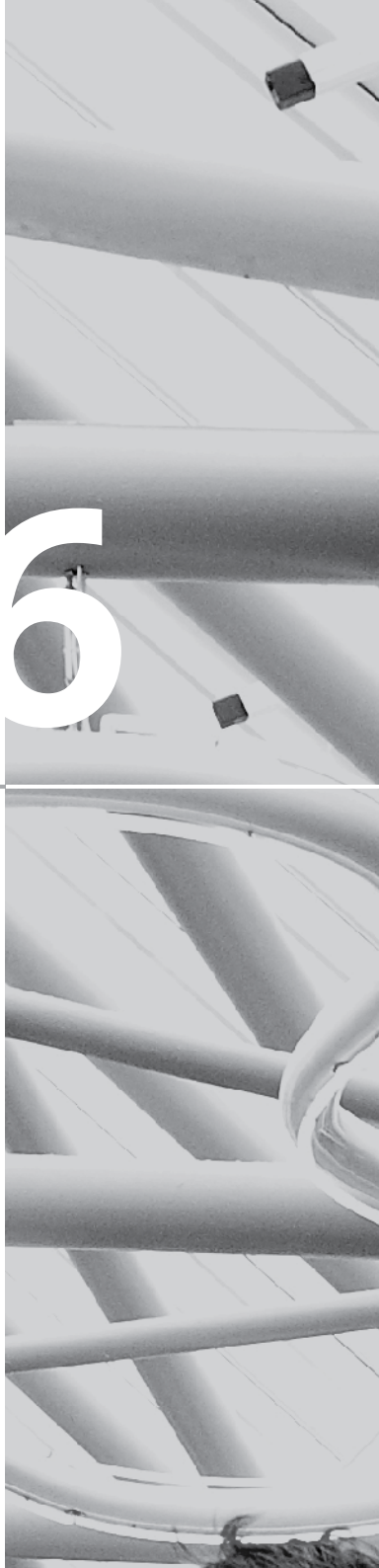
5.7 Schedule Psychopathology

Period	YEAR 1
Period 0, 1 week 31th August – 4th September 2009	Introduction Week
Period 1, 5 weeks 7th September – 9th October 2009	**PSY4105 405RM Interdisciplinary Perspectives** (total of 3 credits)
	Core course: PSY4511 471PP Anxiety Disorders (3 credits) & PSY4106 406RM Advanced Statistics I (total of 2 credits)
	Workshop: PSY4333 496PP Epidemiology (1 credit)
	Skill Training: PSY4531 481PP Research Practicum Psychometrics (total of 2 credits), PSY4532 482PP Clinical Skills I: Interviewing Skills (total of 2 credits) & PSY4534 486PP Clinical Assessment Instruments (total of 2 credits)
	PSY4100 404RM Colloquia (total of 5 credits)
	Electives: 5 credits – throughout year 1
Period 2, 4 weeks 12th October – 6th November 2009	**PSY4105 405 RM Interdisciplinary Perspectives**
	Core Course: PSY4512 472PP Mood Disorders (3 credits) & PSY4106 406RM Advanced Statistics I
	Skill Training: PSY4532 482PP Clinical Skills I: Interviewing Skills, PSY4533 483PP Clinical Skills II: Diagnostic Test Procedures (total of 2 credits) & PSY4534 486PP Clinical Assessment Instruments
	PSY4100 404RM Colloquia
Period 3, 5 weeks 9th November – 11th December 2009	**PSY4105 405RM Interdisciplinary Perspectives**
	Core Course: PSY4513 473PP Stress and Trauma (3 credits) & PSY4106 406RM Advanced Statistics I
	Skill Training: PSY4531 481PP Research Practicum Psychometrics, PSY4533 483PP Clinical Skills II: Diagnostic Test Procedures & PSY4534 486PP Clinical Assessment Instruments
	PSY4100 404RM Colloquia
Christmas break	
Period 4, 4 weeks 4th January – 29th January 2010	**Core Course:** PSY4514 474PP Developmental Psychopathology (3 credits) & PSY4106 406RM Advanced Statistics I
	Workshop: PSY4431 493PP Research Theory and Designs (1 credit)
	Skill training: PSY4108 408RM Neuroanatomy (1 credit), PSY4531 481PP Research Practicum Psychometrics & PSY4534 486PP Clinical Assessment Instruments
	PSY4100 404RM Colloquia
Period 5, 4 weeks 1st February – 5th March 2010	**Core Course:** PSY4515 475PP Somatoform Disorders (3 credits) & PSY4107 407RM Advanced Statistics II (total of 3 credits)
	Workshop: PSY4542 492PP The Application of Cognitive Methods in Psychopathology Research (1 credit)
	Skill training: PSY4534 486PP Clinical Assessment Instruments
	PSY4100 404RM Colloquia

Period 6, 4 weeks 8th March – 2nd April 2010	**Core Course:** PSY4516 476PP Psychosis (3 credits) & PSY4107 407RM Advanced Statistics II
	Workshop: PSY4109 409RM Research Ethics (1 credit) & PSY5106 500PP Case Studies and Single-Case Designs (Elective, 3 credits)
	Skill Training: PSY 4422 485PP Psychophysiological Skills (1 credit) & PSY4534 486PP Clinical Assessment Instruments
	PSY4100 404RM Colloquia
Period 7, 10 weeks 12th April – 18th June 2010	**Core Course:** PSY4517 480PP Eating Disorders & Addiction (4 credits) & **PSY4518** 479PP Forensic Psychopathology (2 credits)
	Workshop: PSY4541 491PP Ecological Psychiatry (1 credit), PSY4334 497PP Imaging (2 credits), PSY4335 498PP Psychopharmacology (1 credit) & PSY4543 499PP Sexual Disorders (Elective, 1 credit)
	Skill training: PSY4534 486PP Clinical Assessment Instruments
	PSY4100 404RM Colloquia

Period	YEAR 2
Period 1, 4 weeks 31th August - 25th September 2009	**Core Course:** PSY5511 571PP Personality Disorders (3 credits)
	Workshop: PSY5101 501RM Advanced Academic Writing (total of 2 credits)
	Skill Training: PSY5531 581PP Clinical Skills III: Clinical Interview for the DSM IV (SCIDI and SCID II) (1 credit)
Period 2, 4 weeks 28th September - 23th October 2009	**Core Course:** PSY5512 572PP Mental Health and Happiness
	Workshop: PSY5101 501RM Advanced Academic Writing
	Skill Training: PSY5522 582PP Clinical Skills IV: Intervention Techniques (1 credit)
32 weeks	**PSY5102 502RM Research internship & PSY5103 Master's thesis** (30 credits)
	PSY5104 503RM Clinical Internship & PSY5105 Minor's thesis (20 credits)

Education and Examination Regulations



6.1 Education and Examination Regulations – Research Master

Outline

Section 1 General conditions

Education and Examination Regulations for the 2009-2010 academic year for the Research Master's Study Programme in the Faculty of Psychology and Neuroscience, as meant in article 7.13 of the Higher Education and Research Act (WHW).

Article 1.1 Scope of the Regulations

These regulations apply to the education and examinations for the full-time Research Master's study programme "Cognitive and Clinical Neuroscience", hereinafter referred to as the study programme.
The study programme is offered by the Faculty of Psychology and Neuroscience in cooperation with the Faculty of Health, Medicine, and Life Sciences, hereinafter referred to collectively as the Faculties.
The Faculty of Psychology and Neuroscience, hereinafter referred to as the Faculty, is responsible for coordinating and administering the study programme. The regulations have been established by the Faculty Board, after the advice from the study programme Committee and the approval from the Faculty Council had been obtained, and will apply as of 1 September 2009 for the 2009-2010 academic year.

Article 1.2 Definitions

In these regulations the following is understood by:
a. The Act: the Higher Education and Research Act (WHW);
b. Student: he/she who has been enrolled at Maastricht University as of 1 September 2009, for the purpose of attending the courses and/or fulfilling the formal requirements of the study programme.
c. Academic year: the period from 1 September of a calendar year through 31 August of the following calendar year.
d. Part: a study unit of the study programme as meant by article 7.3 paragraph 2 of the Act.
e. Tutorial Group Meeting: a practical exercise, as meant by article 7.13 paragraph 2, sub t of the Act.
f. Practical Training: a practical exercise, as meant by article 7.13, paragraph 2, sub d of the Act.
g. Test: the test as part of the examination as meant by article 7.10, paragraph 1 of the Act.
h. Examination: all of the formal requirements (a total of 120 European credits) for the Research Master's study programme for a given specialization, including tests, papers,

assignments, internships, theses, and other requirements as specified for each course or part of the education.

i. Credit: a study load of 28 hours, in accordance with article 7.4 of the Act. The total study load of the Research Master's study programme amounts to 120 European credits.
j. Board of Examiners: the committee as meant by article 7.12 of the Act.
k. Examiner: the person, appointed by the Board of Examiners, who is responsible for assessing student performance.

l. Course Coordinator: an examiner who is responsible for the content of a certain course, workshop, colloquium, skill training, or other part of the study programme.
m. Board of Appeal: the Board of Appeal for Examinations as meant by article 7.60 of the Act.
n. Rules and Regulations: the rules drawn up by the Board of Examiners to ensure a smooth running of the assessments, and the regulations governing the way in which the examinee is assessed and how the results of the assessments are arrived at as meant by article 7.12, paragraph 4 of the Act.
o. Faculty Board: the Executive Board of the Faculty of Psychology and Neuroscience of Maastricht University as meant by article 9.12 of the Act.
p. Grade Point Average: weighted average grade point

Other terms are to be understood in accordance with the meaning assigned to them by the Act.

Article 1.3 Purpose of the Study Programme

1. The Research Master's programme Cognitive and Clinical Neuroscience is a two-year programme designed for students who want to continue their studies at a graduate school that prepares them for a career in the field of research. Therefore, the purpose of the study programme is the following:
   - Academic formation within the context of the Maastricht University educational concept and its distinct profile;
   - provide students with a stimulating scientific environment that will enable them to develop as independent thinkers with a broad curiosity in the various aspects of the multidisciplinary research domain;
   - possibility to broaden one's knowledge in other disciplines;
   - acquisition of specialized knowledge, skills, and insight in one of the four specializations, namely, Cognitive Neuroscience, Fundamental Neuroscience, Neuropsychology, Psychopathology;
   - preparation for a PhD trajectory or a research career in a non-academic setting.
2. There are sufficient elements in the study programme to enhance the further development of the academic formation of the student, in particular with regard to:
   - thinking and acting independently and scientifically;
   - communicating scientifically in English;
   - applying specialized scientific knowledge in a broader context.

Article 1.4 Organization of the Study Programme

The study programme will be offered on a full-time basis.

Article 1.5 Exam of the Study Programme

In the study programme the following exam can be taken: the Master's exam.

Article 1.6 Study Load

The two-year study programme has a total study load of 120 credits (60 credits each year).

Article 1.7 Language of Instruction

The education and examination in the Research Master's study programme are conducted in English.

Section 2 Structure of the Study Programme

Article 2.1 Research Master's Specializations

Specializations in the Research Master's Study Programme

a. Cognitive Neuroscience (CN)
b. Fundamental Neuroscience (FN)
c. Neuropsychology (NP)
d. Psychopathology (PP)

Article 2.2 Composition of the curriculum

1. Cognitive Neuroscience

Core Courses:

- Auditory and higher order Language Processing: 4 credits
- Perception and Attention: 4 credits
- Neuroimaging: Functional MRI: 4 credits
- The Cognitive Neuroscience of Sensory and Motor Systems: 4 credits
- Advanced fMRI: 3 credits
- Magnetic Brain Stimulation: 3 credits
- Tracking the Time-course of Cortical Processing Using MEG and EEG: 3 credits
- The Auditory System: 3 credits
- Neural Correlates of Consciousness: 3 credits
- Neurocognition of Literacy and Numeracy: 3 credits
- Modelling: 3 credits
- Advanced Statistics I: 2 credits
- Advanced Statistics II: 3 credits

Skill Trainings: 11 credits
Each training has a study load of either 1 or 2 credits. The skill trainings provided are listed in the programme's Prospectus.

Workshops: 9 credits
Each workshop has a study load of 1 or 2 credits.
The workshops provided are listed in the programme's Prospectus.

Interdisciplinary Perspectives: 3 credits

Colloquia: 5 credits

Research internship (36 credits) and Master's thesis (14 credits): 50 credits

2. Fundamental Neuroscience
Core Courses:

- Introduction to Molecular and Biochemical Techniques or Introduction to Psychology: 4 credits
- Biopsychological Neuroscience: 4 credits
- Neuroanatomy: 4 credits
- Neurodegeneration: 4 credits
- Neuroplasticity and Pain: 4 credits
- Neurological Disorders: 4 credits
- Neuroimmunology and Inflammation: 4 credits
- Stress, Emotions and Affective Disorders: 4 credits
- Gene x Environment Interactions: 4 credits
- Electrophysiology: from Single Cell Activity to 'Cognitive' Markers: 4 credits
- In Vitro and In Vivo Neuroscience: Models and Tests: 4 credits
- Advanced Statistics I: 2 credits
- Advanced Statistics II: 3 credits

Skill trainings: 3 credits
Each training has a study load of either 1 or 2 credits. The skill trainings provided are listed in the programme's Prospectus.

Workshops: 11 credits
Each workshop has a study load of 1 or 2 credits.
The workshops provided are listed in the programme's Prospectus.

Colloquia: 5 credits

Interdisciplinary Perspectives: 3 credits

Research internship (36 credits) and Master's thesis (14 credits): 50 credits

3. Neuropsychology
Core Courses:

- Brain Damage: 4 credits
- Behavioural Disorders: 4 credits
- Arousal and Attention: 4 credits
- Cognitive Aging: 4 credits
- Biopsychology: 3 credits
- Brain, Learning and Memory: 3 credits
- Executive Functions and Control of Action: 3 credits
- Neuropsychiatric Disorders: 3 credits

- Neuropsychopharmacology: 3 credits
- Cognitive Development: 3 credits
- Stress, the Brain and Psychopathology: 3 credits
- Advanced Statistics I: 2 credits
- Advanced Statistics II: 3 credits

Skill trainings: 11 credits
Each training has a study load of either 1 or 2 credits. The skill trainings provided are listed in the programme's Prospectus. In Year 2, students choose one of the following two options:

- Neuropsychological Treatment Intervention: 1 credit AND
- Data management: 1 credit
  OR
- ERP: 2 credits

Workshops: 9 credits
Each workshop has a study load of 1 or 2 credits.
The workshops provided are listed in the programme's Prospectus.

Interdisciplinary Perspectives: 3 credits

Colloquia: 5 credits

Research internship (36 credits) and Master's thesis (14 credits): 50 credits
(Optional: Research internship (20 credits) and Master's thesis (10 credits): 30 credits, plus Clinical internship (16 credits) and Minor's thesis (4 credits): 20 credits)

4. Psychopathology
Core Courses:

- Anxiety Disorders: 3 credits
- Mood Disorders: 3 credits
- Stress and Trauma: 3 credits
- Developmental Psychopathology: 3 credits
- Somatoform Disorders: 3 credits
- Psychosis: 3 credits
- Eating Disorders and Addiction: 4 credits
- Forensic Psychopathology: 2 credits
- Personality Disorders: 3 credits
- Mental Health and Happiness: 3 credits
- Advanced Statistics I: 2 credits
- Advanced Statistics II: 3 credits

Skill trainings: 12 credits
Each training has a study load of either 1 or 2 credits. The skill trainings provided are listed in the programme's Prospectus.

Workshops: 10 credits
Each workshop has a study load of 1 or 2 credits.
The workshops provided are listed in the programme's Prospectus.

Interdisciplinary Perspectives: 3 credits

Colloquia: 5 credits

Electives: 5 credits
The electives provided are listed in the programme's Prospectus.

Research internship (20 credits) and Master's thesis (10 credits): 30 credits
Clinical internship (16 credits) and Minor's thesis (4 credits): 20 credits

Section 3 Tests and Examination

Article 3.1 Compulsory Sequencing of Parts

1. The research internship cannot be started until:
   - At least 60 credits have been attained during the programme;
   - In the above mentioned 60 credits, the courses Advanced Statistics Part I and Part II must be included.
2. The clinical internship cannot be started until:
   - At least 60 credits have been attained during the programme;
   - In the above mentioned 60 credits, courses Advanced Statistics Part I and II, and for students following the Psychopathology specialization all Clinical Skills (I–IV) trainings must be included; for students following the Neuropsychology specialization the following skill trainings must have been completed:
     - Neuropsychological Assessments
     - Basic Cognitive Psychological Skills
     - Psychophysiological Skills
     - Neuropsychological and Neuropsychiatric Instruments I and II
3. If a student deviates from the sequencing as described under 1 and, if applicable, 2 without permission from the Board of Examiners, the result of the part in question can be declared invalid.

Article 3.2 Periods and Frequency

1. Tests can be taken twice each academic year for each part, one test and one re-sit, at times determined by the Board of Examiners: i.e. once during or immediately following the period in which the relevant part was done and once later in the same academic year.
2. In special cases, the Board of Examiners can decide that a test can take place at a time different from that set in accordance with the previous point.

Article 3.3 Testing

1. Tests
   a. As a rule, tests are in written form. This includes tests done on a computer.

A written test can consist of open questions, multiple choice questions, an individual paper, an essay, a proposal or a report. Part of a test can also consist of a presentation. An examiner needs to receive approval by the Board of Examiners to conduct assessments in a form other than the above mentioned forms.

b. A condition for the registration of test results is the compliance with the minimum requirements for participation in the group meetings as laid down in articles 5 and 6 of section 6.2.
c. The Board of Examiners can draw up guidelines for written papers or other forms of assessment. These guidelines will be included in the programme's Prospectus or in the manual pertaining to the relevant part.
d. The Board of Examiners has the authority to permit a different form of testing in special cases. The Board of Examiners shall notify the students about the different form of testing at least four weeks before the date on which the testing will take place.
e. Students with a functional disability may request permission from the Board of Examiners to take the tests in a manner that is, as far as is possible, in keeping with their disability. The Board of Examiners can ask for expert advice before arriving at a decision.
f. During tests it is not allowed to keep cellular phones or electronic devices other than those specified in the course manual, within reach, even if they are switched off. If a student does not conform to the above, the fraud regulation, as described In the Rules and Regulations, will be applied and the test will be declared invalid.

2. Oral testing
In exceptional circumstances the Board of Examiners has the authority to permit an oral test. A written request has to be submitted to the Board of Examiners. If the request is granted the following conditions will apply:
   a. Oral tests are not given to more than one person at the time, unless the Board of Examiners has decided otherwise.
   b. An oral test is administered by two examiners, unless the Board of Examiners has decided otherwise.
   c. Administering an oral test is done publicly, unless the Board of Examiners or the relevant examiner has decided otherwise in a special case, or if the student has raised objections to this.

3. Research Internship
   a. The Board of Examiners determines the criteria that the nature and content of an internship must meet in the internship regulations.
   b. The internship regulations are set out in Appendix 1.
   c. In order to ensure that the internships proceed smoothly, further guidelines have been drawn up, which can be found in the Manual on Research Internships. The manual is provided to Research Master's students before the end of the first academic year.
   d. A student can only follow a research internship once during his/her programme of study. During the internship the student will be supervised by the Faculty.

4. Clinical Internship
   a. The Board of Examiners determines the criteria that the nature and content of the internship must meet in the internship regulations.
   b. The clinical internship regulations are set out in Appendix 2.
   c. In order to ensure that the internships proceed smoothly, further guidelines have been drawn up, which can be found in the Manual on Clinical Internships. The manual is provided to Research Master's students before the end of the first academic year.
   d. A student can only follow a clinical internship once during his/her programme of study. During the internship the student will be supervised by the Faculty.
   e. PP students may be allowed, but only under exceptional circumstances and with prior approval of the Board of Examiners, to omit the clinical internship and Minor's thesis; in this case, the research internship and Master's thesis would together represent 50 credits.

5. Attendance at Tutorial Group Meetings
   a. The Board of Examiners lays down the minimum of tutorial and practical group meetings per part a student is required to attend in the rules and regulations and determines how the actual attendance of each student in the education is registered.
   b. Students who do not comply with this minimum attendance requirement for the tutorial and practical group meetings, but who have not missed more than one meeting extra than is allowed, can still comply with the compulsory attendance requirement by applying for a compensatory assignment from the Board of Examiners, no later than two weeks after the relevant course has ended. At most, three requests for a compensatory assignment will be granted to a student in each academic year. The Board of Examiners will inform the student whether permission for a compensatory assignment has been granted no later than four weeks after the course assessment has taken place.
   c. If attendance has been met in a given academic year this will be valid for the remainder of the study even if the test is not passed in that year.

Article 3.4 Proof of Having Passed Courses

Once a student has taken part in a sufficient number of tutorial group meetings and has successfully completed the test and any associated practical training of the part, this will count as proof of having passed the relevant part. The proof will be obtained after an examiner has declared that the requirements for that part of the examination have been complied with. A condition for obtaining proof of having passed a part is that the student has complied with the admission requirements for the relevant part of the examination. The Board of Examiners can revoke the decision of the examiner if the admission requirements have not been complied with.

Article 3.5 Grade Point Average

1. A weighted average score (GPA) for all parts of the examination which are assessed on a ten-point scale. Scores will be weighted according to the number of course credits (see also article 2.1).

2. At a provisional transcript, the GPA can also include an insufficient grade.
3. At a provisional transcript, an exam that is not taken, will not be included in the GPA. In that case the number of obtained credits will be reported in relation to the number of credits that could have been obtained in the form of a progress rate.

Article 3.6 Determining and Publishing Results

1. The Board of Examiners determines the norms for the test of each part of the examination.
2. The examiner determines the provisional result of a written test within 15 working days after the day on which the test took place, and provides the educational office with the information needed for the publication of the result to the student.
3. After students have had the opportunity to inspect their corrected works, the definitive results will be determined and published to the student within 5 working days.
4. The examiner determines the result of an oral test immediately after it has been taken and issues the student with a written statement to this effect. If several students take the same test one after the other, the time for determining the result can be extended by one week at the most.

Article 3.7 Period of Validity

As a rule, the period of validity of tests is unlimited. However, by way of exception, the Board of Examiners can set a supplementary or alternative test for a part a student passed more than six years previously.

Article 3.8 Right of Inspection

1. The student, on request, has the right to inspect his/her corrected work within a period of 10 working days after the results of a written test have been made known, at a place and time determined by the course coordinator.
2. The student who has undergone the test can go through the questions and tasks of the relevant test during this inspection, and, in addition, see the norms on which the assessment had been based.

Article 3.9 Exemptions

The Board of Examiners can, on the request of a student, grant exemption from taking a test or other assessment, if the student provides satisfactory written proof that he/she:

1. has already successfully completed a similar part at a university or higher college of higher professional education, which is equivalent in content and level;
2. possesses sufficient knowledge and skills in relation to the relevant test or assessment by way of work or professional experience.

Article 3.10 Fraud

1. Fraud, including plagiarism, is understood as a student's act or failure to act that makes it partially or fully impossible to correctly assess his/her knowledge, insight and skills.
2. Plagiarism is understood as the presentation of one's own or other people's ideas or

words without adequate reference to the source.
3. If the Board of Examiners establishes that a student has committed fraud in an exam or exam component, it may impose suitable measures.
4. The Rules and Regulations (RR) further detail what is understood as fraud and what measures can be imposed by the Board of Examiners.

Article 3.11 Examination

1. The Board of Examiners confirms the result of the Research Master's examination as soon as the student has submitted sufficient proof of having passed the tests..
2. Before the Board of Examiners determines the result of the examination, it is entitled to enquire into the student's knowledge in respect of one or more parts of the study programme, should the results of the relevant tests give reason for this.

Article 3.12 Degree and diploma

1. He/she who has passed the examination successfully will be awarded the degree of 'Master of Science' and will receive the diploma associated with the Research Master's examination as proof of this.
2. The diploma issued as a result of having passed the examination successfully will contain:
   a. the name of the study programme;
   b. the degree that has been awarded;
   c. the most recent date on which the study programme has been accredited, or alternatively has undergone the test of being a new study programme.
3. The diploma will be signed by the Dean of the Faculty and the Chair of the Board of Examiners.
4. The presentation of the diploma is done in public, unless the Board of Examiners decides otherwise in special cases.
5. A separate list of marks will be issued with the diploma.
6. An English diploma supplement will be issued with the diploma. This will specifically mention the specialization followed.
7. The Board of Examiners can award the diploma with the qualification of 'with distinction' in accordance with the Rules and Regulations of the Research Master's examination.

Section 4 Admission

Article 4.1 Admission Requirements for the Research Master's Study Programme (art. 7.30b)

The programme will selectively admit a group of maximally 80 highly qualified students each year. Admission is limited to those with at least a university bachelor's degree or equivalent (obtained by 1 September 2009).

The following documents are needed for application:
- Completed application form
- Application letter that covers the applicant's background and motivation for research training in the chosen specialization (maximum 500 words).

- A Curriculum Vitae (maximum 2 pages)
- A certified English transcript of university courses followed and marks received
- Two academic references completed on the provided forms and mailed directly by the referees.
- Non-native English speakers who have not studied at a Dutch University must provide evidence of satisfactory English test results:
  - o IELTS: minimum score 6.5
  - o TOEFL: minimum score 575 paper-based, 233 computer-based, or 90 internet-based.
  - o Other recognized proof of English proficiency approved by the Board of Examiners

A copy of the official test results is required.

Furthermore, all applicants must pay a non-refundable application processing fee of euro 75. All application materials must be in English and be received by the deadline published on the website.

Admission of qualified students is based on a two-step selection procedure. In the first round the Board of Admission assesses the curriculum vitae, academic record, letter of motivation, academic recommendation letters, and proof of English proficiency, provided by the applicant. Following a favourable decision in the first round, the applicant is invited to the second round, which consists of an individual interview conducted by a member of the Board of Admission and a specialization representative, and a written assignment. Final admittance decisions are made following this.

Article 4.2 Limitations on Enrolment

At least two months before the mentioned closing date published on the website the Dean proposes the maximum number of students to be admitted to each of the four specializations of the Research Master's to the University Board.

The Board of Admission is not bound to admit a minimum number of applicants to the Research Master's programme or to any of its four specializations.

Article 4.3 Board of Admission

1. The Board of Admission of the Research Master's programme is delegated the authority to make judgements concerning admission to the programme and to supply proof of such admission. The Board of Admission consists of:
   a Chair who is also a member of the Board of Examiners;
   b A representative for each specialization;
2. Appointment to the Board of Admission is effected by the Dean, after advice of the programme board.

Section 5 Study advice and guidance

Article 5.1 Study Progress Monitoring

1. The Faculty registers the individual study results of the students in such a way that they can be consulted by the students via SLM.

2. The Faculty furnishes each student with an overview of the personal study results obtained at least once a year (preferably halfway through the second semester).

Article 5.2 Study Mentoring

The Faculty organises an introductory programme and assigns a faculty mentor for the first study year to each student enrolled in the study programme. The mentor guides the learning process and supervises the personal growth of the student. Close monitoring of student performance and progression will help ensure that students complete the Research Master's programme on schedule.

Article 5.3 Study Advisor

Research Master's students may consult a Study Advisor of the Faculty at any time to discuss academic or personal problems. Study Advisors are not members of the Research Master's teaching staff and can provide impartial advice and referrals, as appropriate, to students seeking solutions for such problems.

Section 6 Transitional and Concluding Conditions

Article 6.1 Amendments

1. Amendments in these regulations will be determined by special decision of the Faculty Board on the advice of the study programme commission and with the approval or advice of the Faculty Council.
2. An amendment in these regulations will not apply to the academic year in which it occurs, unless the interests of the students are not adversely affected by such a change.
3. An amendment can furthermore not be to the detriment of students by affecting any other decision that had been taken on the basis of the original regulations.

Article 6.2 Publication

1. The Faculty Board sees to the proper publication of this regulation, of the Rules and Regulations that have been determined by the Board of Examiners, and also of any changes in these, by incorporating them in the programme's Prospectus among other things.
2. Interested persons can obtain a copy of the documents referred to in point 1 from the secretariat of the Board of Examiners.

Article 6.3 Unforeseen Cases

The Board of Examiners decides in cases that have not been foreseen by these regulations.

Article 6.4 Hardship Clause

The Board of Examiners is entitled to deviate from these regulations in individual cases, if a strict adherence will, in its opinion, result in an unfair outcome for the individual, in view of the special circumstances.

Article 6.5 Appeal

When the provisional results of (parts of) tests are announced, the Board of Examiners will notify students of the right to inspection. When the final results are announced the Board of Examiners will notify them of the possibility to appeal against the decision with the Board of Appeal for Examinations as meant in article 7.61 of the Act, and of the period of four weeks within which this appeal has to be lodged. The right of appeal is also communicated to the student in all correspondence regarding a decision of the Board of Examiners which is open to appeal. In addition, the period within such an appeal has to be lodged will be mentioned.

Article 6.6 Date of Taking Effect

This regulation takes effect as of 1 September 2009.
Thus enacted with the approval of the Council of the Faculty of Psychology and Neuroscience in its meeting of 28 May 2009.

No rights can be derived from the education and examination regulations as included here. Copies of the definitive education and examination regulations can be obtained from the secretariat of the Board of Examiners.

6.2 Rules and Regulations

for the Research Master's examination of the Study Programme Cognitive and Clinical Neuroscience

Article 1 Board of Examiners

The Board of Examiners sees to the execution of the regulation for the Research Master's examination and its parts, taking into account the Act and the education and examination regulations concerning the organization and scope of the examinations of the Research Master's study programme of the Faculty of Psychology and Neuroscience. The Board of Examiners will designate examiners to conduct the interim examinations. In particular cases the Board of Examiners can annul decisions taken by the examiners, when e.g., a student has not complied with the admission requirements for a part of the examination which he/she has taken.

Article 2 Composition of the Research Master's Examination

The Research Master's examination consists of the following parts:

a. the courses pertaining to the Research Master's specialization;
b. the other courses, workshops, skill trainings, and colloquia;
c. the tutorial group meetings pertaining to the courses as meant under a.;
d. the research internship and the Master's thesis;
e. where applicable, the clinical internship and Minor's thesis.

Article 3 Requirements for the Research Master's Degree in Cognitive and Clinical Neuroscience

The awarding of the Research Master's degree and the issuing of the relevant Diploma will take place when proof of having passed all parts of the examination mentioned in article 2 have been obtained:

1. At least sufficient marks for each of the assessments;
2. Proof of satisfactory performance for all practical training sessions that are part of the education;
3. Compliance with the attendance requirement for all courses and practical training sessions;
4. Proof of satisfactory completion of the research internship, research proposal and the Master's thesis;
5. Where applicable, proof of satisfactory completion of all components of the clinical internship, the clinical research proposal and the Minor's thesis.

Article 4 Result of the Research Master's Examination

Students who anticipate complying in time with the requirements for the Master's examination and who wish to receive the relevant diploma, must submit a request to the Board of Examiners to determine the result of the examination, at least 2 months prior to the date of graduation. A decision is taken by the Board of Examiners within two weeks before the date of graduation.

Article 5 Proof of Having Passed a Part

1. Core Courses

A student can have a course registered as passed if the following requirements have been met:

- A minimum of 85% attendance at the tutorial group meetings. A student who arrives more than 10 minutes after the official starting time of the meeting shall be considered not to have attended. For admission to the course examination, a student must have attended a minimum of 85% of the tutorial groups per course. If a student has not complied with the minimum attendance requirement but has not missed more than one meeting extra than is allowed, he/she will be admitted provisionally to participate in the course examination. In this case a student can still comply with the minimum attendance requirement by applying for a compensatory assignment;
- A satisfactory assessment and attendance for the practical training, if applicable. A student who arrives more than 10 minutes after the official starting time of the practical training shall be considered not to have attended;
- At least sufficient grades for the final course test. Grades for course tests will be rounded off to the nearest whole or half number. Decimals .1, .2, .8 and .9 will be rounded off to the nearest whole number; decimals .3, .4, .6 and .7 will be rounded off to the nearest half number. A course test is passed when a grade of 6.0 or higher is obtained.

2. Skill trainings

A student can have a skill training registered as having been passed if the following requirements have been met:

- Attendance of 100 % of the skill trainings sessions. If a student has not complied with the attendance obligation but has not missed more than one meeting extra, he/she will be able to apply for a compensatory assignment;
- Timely and satisfactory completion of the required assignments.

3. Workshops

A student can have a workshop registered as having been passed if the following requirements have been met:

- Attendance of a minimum of 85% of the group meetings; if a student has not complied with the attendance obligation but has not missed more than one meeting, he/she will be able to apply for a compensatory assignment;
- Timely and satisfactory completion of the required assignments.

4. Interdisciplinary Perspectives

A student can have an Interdisciplinary Perspectives course registered as having been passed if the following requirements have been met:

- Attending a minimum of 85% of the sessions;
- A satisfactory assessment for the course.

5. Colloquia

A student can have the colloquium series registered as having been passed if the following requirements have been met::

- Registered attendance at a minimum of 15 colloquia; if a student has not complied with the attendance obligation but has not missed more than one meeting, he/she will be able to apply for a compensatory assignment;
- Timely and satisfactory completion of the required assignments.

6. Electives

a. Electives can be regular courses offered by the UM or another university at the Master's level or higher. The content of elective courses should have a link to the RM programme goals. In questionable cases, the Board of Examiners will decide. Course content should not duplicate or extensively overlap with previously taken courses, as judged by the Board of Examiners.
b. Individually-designed electives: Students can design an elective tutorial, research project, or other study, provided that it meets established criteria, as judged by the Board of Examiners. These criteria include: supervision and assessment by a faculty member; a minimum study load of 28 hours per credit; assessment based on a written paper or examination; content linked to the goals of the RM programme, as described on page 8 of the Prospectus (General). A maximum of 3 of the 5 required electives for PP students can be obtained through an individually-designed course or activity. A maximum of 2 credits can be earned for any single individually-designed elective.
c. Applications to register for electives (including individually-designed electives) must be submitted 6 weeks in advance of their starting date to the Board of Examiners.
d. Admission to an elective course can be denied if the student does not have the prerequisite background knowledge.
e. The Board of Examiners will notify students as soon as possible, at the latest within 4 weeks after the application has been submitted, in case their application for an elective cannot be granted.
f. By notifying the Board of Examiners, a student can cancel enrolment in an elective course anytime up to and including the second meeting of a course of at least 4 meetings, or up to and including the first meeting of a shorter course, or during the first week of an individually-designed elective.
g. For elective courses in which a grade is given, this grade will appear on the transcript but is not included in the grade point average.
h. There is no limitation on the number of elective courses students in any specialization may take; however, credits obtained from elective courses cannot be used to substitute for credits that must be obtained from required courses or parts of the curriculum.

Article 6 Attendance Requirements

1. There is a 100% attendance obligation in the case of the practical training sessions.
2. Where attendance of at least 85% of meetings is mandatory, the following applies:
   - of a total of 18 meetings: at least 15 meetings;
   - of a total of 16 or 17 meetings: at least 14 meetings;

- of a total of 15 meetings: at least 13 meetings;
- of a total of 14 meetings: at least 12 meetings;
- of a total of 13 meetings: at least 11 meetings;
- of a total of 12 meetings: at least 10 meetings;
- of a total of 11 or 10 meetings: at least 9 meetings;
- of a total of 9 meetings: at least 8 meetings
- of a total of 8 meetings: at least 7 meetings;
- of a total of 7 meetings: at least 6 meetings;
- of a total of 6 meetings: at least 5 meetings;
- In the case of 5 or fewer meetings there is an attendance obligation of 100%.

3. Attendance will be registered on a form, which is transmitted to the Education Office at the end of the course or training.
4. If a student has not complied with the attendance requirements, the relevant course will not be registered as having been passed, except in the case of a compensatory assignment as stated in article 5, sub 1, point 1.
5. If attendance has been met in a given academic year, this will be valid for the remainder of the study, even if the test is not passed in that year.

Article 7 Compensatory Assignment

In order to qualify for a compensatory assignment a student must apply for this within two weeks after the course is finished by filling in the form Request Compensatory Assignment Insufficient Attendance (to be collected at the education desk or to be downloaded from EleUM) and handing it in at the education desk (40 Universiteitssingel) during opening hours. The student will receive a receipt, with the deadline for handing in the assignment on it. The assignment must be handed in to the course coordinator within four weeks after it has been given to the student. If this compensatory assignment is considered to be satisfactory the student will be considered to have complied with the attendance requirements and the provisional result of the course examination shall be ratified. If the request for a compensatory assignment has not been submitted in time and/or more than one meeting above what is allowed has been missed, the compensatory assignment will not be given and the provisional result of the course examination will be annulled. The student will then have to comply with the attendance obligation and take the course examination in the following academic year. A student can qualify for a compensatory assignment at the most three times per academic year.

Article 8 With Distinction Degree Completion

1. Degree completion "with distinction" is attached to the Research Master's examination, if each of the following requirements has been met:
   a. A weighted grade point average (GPA) of at least 8.5 for all parts of the Research Master's examination that are assessed on a ten-point scale, with the exception of elective courses (see Article 5, 6.g). Furthermore, all assessments must be passed on the first attempt.
   b. Weighting of course grades occurs according to the credits obtained in each course (see also Article 2.3).
   c. Master's thesis: a score of at least 8.0 or, where applicable, the proportional

average of the scores for the Master's thesis and the Minor's thesis is at least 8.0.

d. In the calculation of the overall GPA, thesis grades are weighted as follows: the Master's thesis is equivalent to 14 European credits; for students writing both a Master's and a Minor's thesis, the Master's thesis is equivalent to 10 credits and the Minor's thesis to 4 credits.

Article 9 Exemptions

1. Request for exemption from taking a test or undergoing another part of the examination on the strength of what has been determined by the Act will be submitted to the Board of Examiners. Written proof must be submitted to support the request.
2. The Board of Examiners makes a substantiated decision within four weeks after having received the request. The Board of Examiners is entitled to extend this period of four weeks by an additional period of four weeks. The student will be informed of the Board of Examiners' decision in writing.
3. No credits will be awarded for the parts of the examination for which exemption has been granted.

Article 10 Reassessments/Resits

The following reassessment/resit arrangements apply to students who in the first instance have not passed a part of the Research Master's examination. The relevant reassessments/resits are available only to students who have complied with the attendance requirement.

1. Core courses

The student who failed a course assessment will get one other opportunity to resit that examination per academic year. If a student passes the initial assessment he/she cannot resit the examination. In the case of a reassessment the highest mark counts.

2. Workshops, Skill trainings, Interdisciplinary Perspectives, and Colloquia

Students who failed a task of a practical training will have to complete a reassessment in the same academic year.

3. Papers

There will be one chance per part to redo papers (including the Master's and Minor's thesis) per academic year. This will consist of rewriting the relevant paper. A paper can only be rewritten when it has been turned in before the deadline and a serious attempt had been made, but was failed.

Article 11 Fraud, including plagiarism

1. The Board of Examiners may impose a measure set down in paragraph 4 of this article if it establishes that a student, in any exam or exam component:
   a. has had any unauthorised aids, texts or notes at his or her disposal, or has used unauthorised electronic aids and/or communication devices
   b. has communicated or tried to communicate with another student, either verbally

or through gesture, without permission from an exam supervisor, examiner, or Board of Examiners member
   c. has copied or tried to copy another student's answers, or has given another student the opportunity to copy his/her own answers
   d. has posed as someone else or let someone else pose as him/her
   e. has deliberately misled or tried to mislead an exam supervisor, an examiner, a corrector or the Board of Examiners with respect to the exam, or has provided an opportunity for them to be misled.
2. The Board of Examiners may impose a measure set down in paragraph 4 of this article if it establishes that a student has committed plagiarism in any exam or exam component, including:
   a. using or copying his/her personal or other people's texts, data, ideas or thoughts without adequate reference to the source
   b. presenting the structure or central body of thought from others without adequate reference to the source and thus passing it off as his/her own
   c. not clearly indicating literal or almost literal quotations in the text, for example via quotation marks or a certain layout
   d. paraphrasing the content of his/her own or other people's texts without adequate reference to the source
   e. copying video, audio or test material, software and program codes from others without adequate reference to the source and thus passing them off as his/her own
   f. copying work from fellow students and thus passing it off as his/her own
   g. submitting work or assignments acquired from or written by a third party (whether or not for payment) and thus passing them off as his/her own.
3. If the Board of Examiners establishes that a student has committed fraud in any other way in any exam or exam component, it can impose a measure set down in paragraph 4.
4. In the cases referred to in paragraphs 1, 2 and 3, the Board of Examiners can declare the results of the relevant exam null and void, and impose:
   - a reprimand
   - exclusion from participation or further participation in one or more exams in the programme for a maximum of one year.
5. Before the Board of Examiners imposes a suitable measure, the student concerned is given the opportunity to be heard.
6. If fraud is established, this is included in the student's dossier.
7. If an investigation establishes that the student did not commit fraud, correspondence on the alleged fraud is anonymised and not included in the student's dossier.
8. The Board of Examiners does not grant exemptions on the grounds of study results obtained elsewhere while the student was excluded from participating in the programme's exams because of the fraud committed.

Article 12 Hardship Clause

The Board of Examiners has the right to deviate in individual cases from what has been determined in the regulation on the request of a student, if a strict application of the rules would lead to an unfair or unreasonable situation.

Article 13 Implementation and Date of Taking Effect

1. The Board of Examiners makes decisions in all cases that have not been foreseen by the Rules and Regulations.
2. These Rules and Regulations take effect in the academic year 2009-2010.

6.3 Appendices
with the rules and regulations of the Research Master's examination

Appendix 1: Regulation on Research Proposal, Research Internship, and Master's thesis
Appendix 2: Regulation on Clinical Internship and Minor's Thesis

APPENDIX 1 Regulation on research proposal, internship, and Master's thesis

Article 1 Research proposal

1. A research proposal is an independently written proposal concerning research that the student intends to conduct during his/her internship.
2. The research proposal consists of the following parts:
   - a brief theoretical background of the research;
   - the question posed by the research;
   - a description of the research plan;
   - a description of the research methods that will be applied;
   - a description of the techniques that will be used for processing and analysing the data;
   - a timetable.
3. Guidelines for the format and length of the research proposal can be found in the Research Internship Manual.
4. The assessment is done by two assessors. They are: a. two senior staff members of the Faculties if the internship is done internally (supervisor from the Faculties and a second assessor), or b. the external supervisor and the supervisor from the Faculties in case the internship is done outside the Faculties.
5. The research proposal must be submitted within 4 weeks of commencing the research internship
6. Before the student can commence research activities, formal permission for the study must have been obtained from the appropriate Ethics Commission/Institutional Review Board.

Article 2 Research internship

1. A student is required to do a research internship and Master's thesis at the conclusion of his/her study programme. If applicable, the clinical internship and Minor's thesis can be done before, after, or together with the research internship.
2. The student notifies the educational office about the internship at least one month before the start of the internship by means of a research internship notification form. The board of examiners checks whether the student has complied with the requirements in article 3.1, point 1 of the education and examination regulations.
3. An internship agreement is drawn up separately for each internship, in which a number of arrangements are set out between the institution where the internship takes place, the supervisor from the Faculties and the student. A copy of this agreement is sent to the educational office at least one month before the internship starts.

4. The student will be supervised during the internship by a supervisor from the Faculty and a supervisor from the institution where the internship takes place (internship supervisor). The task of the supervisor from the Faculties and/or the internship supervisor consists in advising the student in matters of content with respect to the internship activities and the reporting of these in a Master's thesis (see Appendix 1: Article 3, Regulation Master's thesis). In addition, the supervisor from the Faculties is the contact person with the institution where the internship takes place.
5. After the practical part of the research has been finished, an evaluative discussion takes place between the internship supervisor, the supervisor from the Faculty and the student. The internship is registered as having been completed successfully by the internship supervisor or the supervisor from the Faculty on an assessment form, which is sent to the educational office.

Article 3 Master's thesis

1. A Master's thesis is an independently written report of the research that has been conducted during the research internship.
2. The Master's thesis is in principle an individually written piece of work.
3. The Master's thesis is assessed on the following aspects: the research question, scientific content, argumentation and form.
4. Guidelines for the format and length of the Master's thesis can be found in the Research Internship Manual.
5. The student must submit three copies of the Master's thesis to the educational office and one electronic version to an e-mail address that is announced on EleUM. Two copies, together with the individual assessment form, are sent on to the internship supervisor / supervisor from the Faculties and to the supervisor from the Faculties / second assessor. The assessment form, filled in and signed by both supervisors, is sent back to the educational office together with a written explanation within 20 working days. The educational office keeps one copy of the approved Master's thesis for filing. A copy of the electronic version is sent to the University Library unless the institution where the Internship took place has objections to this.
6. If the Master's thesis is awarded insufficient marks, the Regulation for Reassessments for Papers, article 10, point 3 of the Rules and Regulations for the Research Master's examination of the study programme apply.
7. The Master's thesis is graded (the average of the scores given by the first and the second assessor).

APPENDIX 2 Regulation on clinical internship and Minor's thesis

Article 1 Clinical internship

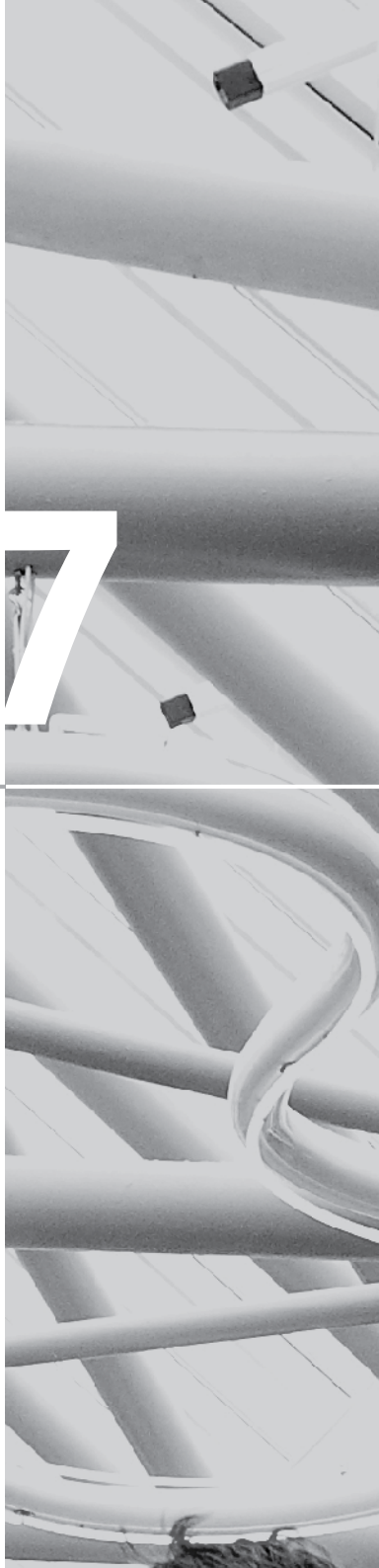
1. Students following the Psychopathology specialization are required to (and students following the Neuropsychology specialization may choose to) complete a clinical internship of 13 weeks or the equivalent (520 hours).
2. The student notifies the educational office about the internship at least one month before the start of the internship by means of a clinical internship notification form. The board of examiners checks whether the student has complied with the requirements in article 3.1, point 2 of the education and examination regulations.
3. An internship agreement is drawn up for each internship in which a number of arrangements are set out between the institution where the internship takes place, the Clinical Internship coordinator from the Faculty and the student. A copy of this agreement is sent to the educational office at least one month before the internship starts.
4. The student will be supervised during the internship by a supervisor from the Faculties and a supervisor from the institution where the internship takes place (internship supervisor). The task of the internship supervisor from the institution is to guide and monitor the student's clinical activities, and to facilitate the clinical research project. The supervisor from the Faculties advises the student concerning the conduct and reporting of research for the Minor's thesis (see Appendix 2, Article 2, Minor's thesis) and is the contact person with the institution where the internship takes place.
5. After the practical part of the clinical internship has been completed, an evaluative discussion takes place between the institutional internship supervisor, the Clinical Internship coordinator from the Faculty and the student. The internship is registered as having been completed successfully when the Clinical Internship coordinator has approved the student's clinical activities report, has received a satisfactory assessment of the internship performance from the supervisor from the institution, and has sent the relevant assessment form to the educational office.
6. PP students may be allowed, but only under exceptional circumstances and with prior approval of the Board of Examiners, to omit the clinical internship and Minor's thesis; in this case, the research internship and Master's thesis would together represent 50 credits.

Article 2 Minor's thesis

1. All students who elect or are required to follow a clinical internship are required to write a Minor's thesis.
2. The Minor's thesis is an independently written research report, based on a clinical topic relevant to the clinical setting where the internship is conducted.
3. A research proposal must be submitted to and approved by the clinical internship supervisor of the Faculties before the research activities commence.
4. Guidelines for the format and length of the research proposal can be found in the Clinical Internship Manual.
5. Before the student can commence research activities, formal permission for the study

must have been obtained from the appropriate Ethics Commission / Institutional Review Board of the institution where the internship is conducted.

6. The Minor's thesis is assessed on the following aspects: the clinical research question, scientific content, argumentation and form.
7. The student must submit two copies of the Minor's thesis to the educational office and one electronic version to an e-mail address that can be found on EleUM. One copy, together with the individual assessment form, is sent on to the UM supervisor from the Faculties. The assessment form, filled in and signed by the supervisor, is sent back to the educational office together with a written explanation within 20 working days. The educational office keeps one copy of the approved Minor's thesis for filing.
8. If the Minor's thesis is awarded insufficient marks, the Regulation for Reassessments for Papers, article 10, point 3 of the Rules and Regulations for the Research Master's examination of the study programme applies.
9. The Minor's thesis is graded by the clinical internship supervisor/assessor at Maastricht University.



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