Applied Statistics I

Faculty of Psychology and Neuroscience

PSY4162

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
4.0

Coordinator:
J. Schepers

Teaching methods:
Lecture(s), Skills, Assignment(s)

Assessment methods:
Written exam, Attendance, Assignment

Keywords:
univariate analysis of variance, multivariate analysis of variance, regression analysis, within-subject designs, repeated measures ANOVA, mixed (multilevel) regression, marginal versus random effects models

Full course description

The course consists of eights units.
In the first four units, students 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. Students are assumed to have background knowledge of balanced two-way factorial ANOVA and multiple regression. These methods will be briefly reviewed. The following advanced topics will then be covered: unbalanced factorial designs, contrast analysis, interaction in multiple regression, simple slope analysis, dummy coding, centering covariates, different coding schemes, collinearity and residuals checks and data transformation.
The second half of the core course consists of four units, two on repeated measures ANOVA and two on mixed linear regression for repeated measures. The first two units cover classical repeated measures ANOVA for the one- and two-way within-subject design and the split-plot (between x within) design. Special attention is given to: a) the choice between multivariate and univariate data formats and method of analysis, and the sphericity assumption; b) the distinction between the

within-subjects and between-subjects part of a split-plot ANOVA, and how to obtain both using regression analysis;

Subsequently, two units are devoted to mixed (multilevel) regression for repeated measures. This starts with a unit on marginal models for repeated measures as an alternative to repeated measures ANOVA in cases of missing data and/or of within-subject covariates. Students are shown the pros and cons of various models for the correlational structure of repeated measures, such as compound symmetry and AR1. The second unit covers the random intercept and random slope model for repeated measures as a method to include individual effects into models for longitudinal data (growth curves) or single trial analyses of lab data (response times, ERP, fMRI). Students learn how this can be combined with e.g. ARMA modelling to distinguish between inter-personal and intra-personal outcome variation.

The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to understand:

- oneway analysis of variance, contrast analysis, unbalanced designs, multivariate analysis of variance, discriminant analysis, linear regression with interaction terms, linear regression with dummy variables, data transformations, simple slope analysis, analysis of covariance
- repeated measures ANOVA for within-subject and split-plot (between x within) designs, mixed (multilevel) linear regression with random effects and autocorrelation, and so-called marginal models;
- Specifically, students are able to choose the correct method of analysis, and specify a statistical model to compare different models and choose the best model (based on checking assumptions, model fit and parsimony on top of plausibility), and to interpret effect estimates and significance tests obtained with that model.

Prerequisites

Good understanding of descriptive and inferential statistics at the elementary and intermediate level, including t-tests

Introduction to Molecular Biochemical Techniques

Faculty of Psychology and Neuroscience

PSY4311

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
5.0

Coordinator:
G.R.L. Kenis

Teaching methods:
PBL, Lecture(s), Skills, Assignment(s), Research

Assessment methods:
Written exam, Final paper, Participation, Attendance

Keywords:
RNA, DNA, protein, ELISA, RIA, PCR, Western blot

Full course description

This course focuses on fundamental biological concepts including cellular organisation, DNA, RNA and proteins. Additionally, this course provides students with a conceptual understanding of the most important concepts 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.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- cell biology, molecular biology, biochemistry, regulation of gene and protein transcription, research methods in molecular cell biology and vocabulary (e.g. scientific and technical words).

Students will be able to apply:

- acquisition of basic laboratory techniques, including preparation of buffers, pipetting, pH titration, a protein assay (standard curve), RNA extraction and DNA isolation, conventional PCR.

Prerequisites

This introductory course is required for students with a psychological background. The parallel course PSY4312 is required for students with a biological background. Thus, students enroll in either PSY4311 or PSY4312. The course coordinators of both courses evaluate which of the two courses a student is required to take.

Introduction to Psychology

Faculty of Psychology and Neuroscience

PSY4312

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
5.0

Coordinator:
E.L. Theunissen

Teaching methods:
PBL, Lecture(s), Paper(s), Assignment(s), Presentation(s)

Assessment methods:
Final paper, Participation, Presentation, Attendance

Keywords:
Introduction, behaviour, cognition, Psychology, introduction

Full course description

In this course students acquire an overview of human cognitive psychology. A selected number of psychological themes are covered, surveying knowledge on how humans act and interact, how they differ from each other, how they reason and how they 'know' things. The course focuses on 'normal' human performance, but malfunction and psychopathology are also covered. The major emphasis of the course is on understanding human behaviour by means of cognitive, non-biological theories and paradigms.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- psychological methods and designs;
- cognition, perception, personality, behaviour, consciousness.

Prerequisites

This introductory course is required for students with a biological background. The parallel course PSY4311 is required for students with a psychological background. Thus, students enroll in either

PSY4311 or PSY4312. The course coordinators of both courses evaluate which of the two courses a student is required to take.

Introduction in Genetics

Faculty of Psychology and Neuroscience

PSY4340

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
1.0

Coordinator:
S.E. Pishva

Teaching methods:
Lecture(s), Assignment(s), Work in subgroups, Presentation(s)

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
DNA, RNA, genetic variation, polymorphism, gene expression, genetics, epigenetics, genetic association, heritability, Genetics

Full course description

While genetic liability to neurological and psychiatric disorders has been established, the search for the responsible genetic factors is still ongoing. This workshop focuses on how genetic variations confer risk of complex diseases. Students will gain insight, by using theoretical models, into how these alterations affect DNA transcription, RNA processing and protein synthesis, ultimately leading to variation in phenotype expression. An initial overview is given of sources of genetic variation, ranging from large scale alterations in the genome structure to common variations such as single nucleotide polymorphisms. Advantages and disadvantages of current strategies in genomic research, such as genome wide association studies, will be examined. Regulation of gene expression including epigenetic processes such as DNA methylation and histone modifications are then discussed. At the end of this course, students will be able to better understand, interpret and critically evaluate recent reports on large scale genetic studies of common complex diseases.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

genetic variation, polymorphisms, copy number variations, haplotypes, linkage analysis, linkage disequilibrium, mendelian inheritance, population genetics, epigenetics, genetics of complex neuropsychiatric diseases, genome wide association studies, regulation of gene expression, DNA methylation, histone modifications, gene-environment interplay, micro-RNA.

Practical Training: Genes and Proteins

Faculty of Psychology and Neuroscience

PSY4341

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
0.0

Coordinator:
G.R.L. Kenis

Teaching methods:
Skills, Paper(s), Research, Work in subgroups

Assessment methods:
Final paper, Attendance, Observation

Keywords:
General laboratory techniques, RNA, DNA isolation, protein purification, ELISA, PCR/ RT-PCR, Western blot

Full course description

This practical training provides students with a 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 This includes basic laboratory techniques such as pipetting, pH titration and a protein assay. Specific techniques performed in the lab are DNA/RNA isolation and analysis, DNA synthesis and PCR
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- standard techniques in molecular research laboratories;
- acquaintance with terms of molecular biology/biochemistry.

Practical Training: Measuring Cognitive Functions

Faculty of Psychology and Neuroscience

PSY4353

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
0.0

Coordinator:
E.L. Theunissen

Teaching methods:
Skills, Assignment(s), Research

Assessment methods:
Attendance, Assignment

Keywords:
Cognitive functions; psychological experiment.

Full course description

You will participate in a practical session in which you will administer and perform cognitive tasks. You will be provided with experiment data and will be responsible for conducting data analysis, and presenting the findings on a poster. Additionally, you are expected to explore our faculty's Research Participation System (SONA) and obtain 1 credit by participating in one or more research studies. You will also be required to write a brief report detailing the study or studies' design and dependent variables.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- psychological experiment, measuring cognitive functions;
- data analysis;
- presenting (poster).

Medical Needs & Failures, Target Discovery

Faculty of Psychology and Neuroscience

PSY4818

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
3.0

Coordinator:
R. Schreiber

Teaching methods:
PBL, Lecture(s), Assignment(s), Presentation(s)

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
target identification, target validation, disease dissection

Full course description

The course covers broadly how research and development of new medicines is initiated for diseases of the nervous system. We will focus on three diseases that are each unique in terms of their pathophysiology; 1) The neurodegenerative disorder, Alzheimer's Disease (AD); 2) The neurological disorder, Multiple Sclerosis (MS) & repair mechanisms; and 3) Neuro-inflammation and the blood brain barrier in MS. The general set-up of the sessions is 1. To elaborate on the characteristics and etiology of a given disease; 2. What are the current treatment strategies and which mechanisms do they modulate; 3. What is the remaining unmet medical need and why did previous trials fail; and 4. Which are the upcoming therapeutic strategies in terms of preclinical leads and compounds currently in clinical trials.
In this course there is a special focus on neuroinflammation and the blood brain barrier.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

The ILO's are:

- To understand the pathophysiology in AD, MS and PTSD; the strengths and weaknesses of current treatments; and the unmet medical need

- To understand the role of the central and peripheral nervous system to the pathophysiology of diseases of the nervous system such as AD, MS and PTSD
- To understand the principles of neuroinflammation and the underlying neuroimmunological mechanisms
- To understand the function of the blood-brain-barrier (BBB); how BBB penetration can be assessed, and methods for transporting molecules across the BBB
- To apply ILOs 1-4 in writing a paper on an existing drug target or clinical target retrievable in the literature, focusing on the neuroinflammation disease target

Drug Metabolism and Safety

Faculty of Psychology and Neuroscience

PSY4814

Period 2:
27 Oct 2025 **19 Dec 2025**

Credits:
5.0

Coordinator:
J. Krauskopf

Teaching methods:
PBL, Skills, Paper(s), Assignment(s), Presentation(s)

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
drug safety, Pharmacokinetics, drug toxicity, in-silico tools

Full course description

This course provides an insight into human drug metabolism at the molecular and cellular level, from pharmacological to toxic levels, and drug safety evalution processes, ranging from insight into the current safety regulations to novel concepts in safety assessment based on scientific innovations in cell models to replace test animals and in-silico-tools recently developed for a better prediction of drug safety before market introduction. It will also focus on the advantages of personalized medicine, pharmacokinetics and toxicogenomics. It will provide insight into how to extract relevant information such as dose finding and pharmacokinetics, from toxicological datasets and how this can be used to predict (un)safety, related mechanisms and unwanted side effects of different drugs.

The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- pharmacokinetics, drug metabolism, dose finding, ADME concept;
- toxicology, toxicogenomics drug safety evaluation, regulatory requirements.

Skills:

- detection of the differential toxic effects on neuronal cells based on gene expression detected by PCR.

Valorisation

Faculty of Psychology and Neuroscience

PSY4834

Period 2:
27 Oct 2025 **19 Dec 2025**

Credits:
2.0

Coordinator:
M.J.G. GoversR. Schreiber

Teaching methods:
PBL, Lecture(s), Assignment(s), Work in subgroups, Presentation(s)

Assessment methods:
Attendance, Assignment

Keywords:
valorisation, value creation, startup, license, patent, collaboration

Full course description

Among the roles of the university is a responsibility to deliver research that will serve the needs and interests of society. The Drug Development and NeuroHealth research master teaches students the knowledge, skills and capabilities that are needed for the discovery and development of novel therapeutics for psychiatric and neurologic disorders. Our workshop “Commercialising Science & Technology” helps you to understand and master the initial steps of the entrepreneurial process. That is, how to translate science into innovative product ideas and valorise your novel scientific insights. Valorisation is defined as ‘’The process of value creation from knowledge, by making it applicable and available for economic or societal utilisation, and by translating it in the form of new business, products, services, or processes’’. CNS drug discovery is an exceptional long and complex process with high failure rates. It is of paramount importance for students to learn first-hand what the unmet medical needs of patients are. Therefore, we opted for a patient-centric approach. With the help of tools such as ‘personification’ and ‘business canvas’ you will develop your ideas for novel therapeutics and present these to an expert panel at the last workshop session.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- valorisation theory and practice;
- the creation of tangible output from neurohealth research in the form of products, services and/or tools and the role patents, licenses, startups and collaborations can play to arrive at that stage.

Drug Discovery

Faculty of Psychology and Neuroscience

PSY4842

Period 2:
27 Oct 2025 **19 Dec 2025**

Credits:
4.0

Coordinator:
A. Blokland

Teaching methods:
PBL, Presentation(s)

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
hit, lead (optimization), candidate, target engagement, structure activity relationship (SAR), target identification and validation, low-high throughput screening, recombinant antibody, phage display, common mechanisms, ADME

Full course description

Student will become acquainted with the different strategies of drug discovery from early stages in which molecules are screened in low to high throughput screens from representative chemical or virtual libraries; subsequently, the obtained hit molecules are optimized with respect to pharmacodynamics and pharmacokinetics (ADME) to first lead compounds for in vivo testing in healthy animals and animal models of disease; this is followed by further optimization until eventually candidate molecules for registration and clinical development are defined. Patenting may occur at any point along that time-line and has to take the compound life cycle and later clinical development failures into account. Next to small molecule discovery, attention will be given to the recent development of recombinant human(ised) therapeutic antibodies. As a prerequisite for these rather standard processes, classical and possible future strategies of target identification and validation will be presented and analysed. In this context, important issues regarding the translational value of in vitro vs. in vivo models will be discussed.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able:

- to give a good rational/definition of a medicinal drug;
- to explain the different targets that drugs can have. This can be receptors, enzymes, second messengers, and biological targets;
- understand the characteristic features of drugs how they bind to the different type of targets (in the brain);
- to explain how high-throughput screening is done and how different tets models can be used for this purpose;
- to explain what the use of in vivo and in vitro models has in the drug discovery program. Students will know the principles of selecting a good test battery for a drug discovery program. They will be able to apply concepts as construct-, external-, and predictive validity;
- to write a research discovery plan starting form novel target, to drug finding, to drug testing;
- to understand the requirements for proposing a drug candidate for clinical development.

Colloquia

Faculty of Psychology and Neuroscience

PSY4100

Period 3:
5 Jan 2026 **30 Jan 2026**

Credits:
1.0

Coordinator:
R. Schreiber

Teaching methods:
Lecture(s)

Assessment methods:
Attendance

Keywords:
interdisciplinary knowledge

Full course description

Each specialisation organizes two colloquia, in which senior researchers from Maastricht University or visiting lecturers present their scientific insights. Each colloquium focuses in depth on one of a wide range of topics, with issues transcending the courses and specialisations. Each colloquium lecture will be followed by active discussion, chaired by the lecturer or the host of the guest lecturer. A total of ten colloquia will be offered.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to understand:
key research domains from different specialisations;

- interdisciplinary research.
- Students are able to interact with students from different specialisations.

Neuroanatomy

Faculty of Psychology and Neuroscience

PSY4108

Period 3:
5 Jan 2026 **30 Jan 2026**

Credits:
1.0

Coordinator:
D.L.A. van den Hove

Teaching methods:
Lecture(s), Skills, Work in subgroups

Assessment methods:
Written exam, Attendance

Keywords:
Neuroanatomy, limbic system, basal ganglia, basal ganglia.

Full course description

The aim of this practical training is to make you acquainted with the neuroanatomical terminology and to gain insight into the spatial and functional organisation 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 direct linkage of specific neurological or psychiatric disorders to particular brain areas. After a short theoretical introduction, you 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.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to understand:

- organisation of the brain, in particular the ventricular system, the (cortico)limbic system and basal ganglia;
- brain dissection;
- microscopical staining techniques.

Introduction to R

Faculty of Psychology and Neuroscience

PSY4373

Period 3:
5 Jan 2026 **30 Jan 2026**

Credits:
1.0

Coordinator:
S.E. PishvaW. Viechtbauer

Teaching methods:
Skills, Paper(s), Assignment(s), Work in subgroups

Assessment methods:
Attendance, Assignment

Keywords:
R, statistical software

Full course description

R is a programming language and software environment for carrying out computations, manipulating and analyzing data, and creating various types of plots and graphics (https://www.r-project.org). R has become the 'lingua franca of statistics' and the software of choice for analyzing data in various disciplines. However, for many researchers, getting up and running with R remains a hurdle due to the command-driven nature of the software. The purpose of this course is to lay the necessary foundation for becoming a proficient R user.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students will learn about the history and development of R, how to use and interact with R, understand its basic data structures, be able to import and export data files, inspect and manipulate data and obtain summary statistics, create various types of data visualizations, apply standard statistical techniques (e.g., t-tests, correlation, regression, ANOVA), find/install/use add-on packages, know how and where to obtain help when getting stuck, be able to use basic programming structures (e.g., loops, if-else statements), and write documents with R Markdown.

Big Data in Drug Discovery and Development

Faculty of Psychology and Neuroscience

PSY4819

Period 3:
5 Jan 2026 **30 Jan 2026**

Credits:
3.0

Coordinator:
D.G.J. Jennen

Teaching methods:
PBL, Skills, Paper(s), Assignment(s), Research, Presentation(s)

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
omics, drug discovery & development, big data, bioinformatics

Full course description

This course provides an in-depth insight how to exploit information publicly available in multiple web-based data infrastructures and how to use different software tools for drug discovery, design and further development. It will provide an introduction to how drugs can be designed using tools that can be applied for docking of potential molecular drug structures to protein targets, computerized tools that can be used to calculate properties of drugs (e.g. logP, Molecular Weight, Lipinski Parameters, etc.) and abstracted bioactivities (e.g. binding constants, pharmacology and ADMET). It will also provide insight how to use genomics data for complementing drug structure-activity relationships, including data retrieved from patients, which can be applied for identifying potential targets of drugs. The course also encompasses practical training in using these different in silico tools, which will be used to gather information about potential drugs and of existing drugs.

The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- biomarker discovery, exploring mechanisms, use of omics approaches;
- in-silico modelling, computerized drug-protein interactions and activities;

- training how to use different databases, eTox, ChEMBL, Open Phacts, Open TG-GATEs, diXa, as well as relevant software tools;
- skills: Computer supported Training in Big Data in Drug Discovery & Development;
- biology underlying fundamental psychological processes.

Practical Training: Computer supported Training in Big Data in Drug Discovery and Development

Faculty of Psychology and Neuroscience

PSY4822

Period 3:
5 Jan 2026 **30 Jan 2026**

Credits:
0.0

Coordinator:
D.G.J. Jennen

Teaching methods:
Assignment(s)

Assessment methods:
Attendance, Assignment

Keywords:
omics, drug discovery & development, big data, bioinformatics

Full course description

Skill training along with Core Course 'Big Data in Drug Discovery & Development'. In this training you'll experience a hands-on approach for modern target identification and validation. You will get familiar with the tools used in drug target evaluation and perform your own drug target analyses. Furthermore, you will use genomics data for complementing drug structure-activity relationships and for identifying potential targets of drugs. Finally, you will use the different data sources to categorise/group drugs via an integrated approach.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:
skills in using different in silico tools which will be used to gather information about potential drugs and existing drugs.

Drug Discovery & Development Project Management

Faculty of Psychology and Neuroscience

PSY4833

Period 3:
5 Jan 2026 **30 Jan 2026**

Credits:
1.0

Coordinator:
R. Schreiber

Teaching methods:
Lecture(s), Presentation(s)

Assessment methods:
Presentation, Attendance

Keywords:
screening cascade, project stages, filter criteria, project milestones, Gantt chart

Full course description

Background. A key component of every discovery project is the so-called 'progression scheme'. The stages of such a scheme typically consists of a series of activities, such as target identification and hit finding, with corresponding milestones, such as target selection and the selection of hits. Selection of the right assays, tests and models, and the implementation of relevant criteria for compounds to pass to the next stage is essential for the success of a discovery project. As is management of the compound flow through the various stages.

Project management. In this hands-on course, the elements of the progression scheme will be explained and how the different activities are connected with each other. Subsequently, students will work in small teams to develop a progression scheme for a defined CNS discovery project. Activities and timelines will be recorded in a simplified Gantt chart. Every team will present their scheme at the end of the workshop.

The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- progression scheme;
- target identification & selection;

- target assessment & validation;
- hit finding & identifcation;
- high throughput screening;
- lead finding & selection;
- nomination preclinical development candidate;
- Proof of Mechanism & Proof of Concept;
- behavioral models for CNS diseases;
- project management, multidisciplinary teams;
- Gantt chart.

Applied Statistics II: A

Faculty of Psychology and Neuroscience

PSY4163

Period 4:
2 Feb 2026 **2 Apr 2026**

Credits:
2.0

Coordinator:
J. Schepers

Teaching methods:
Lecture(s), Skills, Assignment(s)

Assessment methods:
Written exam, Attendance, Assignment

Keywords:
sample size, power, structural equation modeling, LISREL, bootstrapping, permutation test, cross-validation

Full course description

Theme 1, Period 4, offered in PSY4163 & PSY4164

Course lecturer: Gerard van Breukelen

Sample size calculation and nested designs: This course provides an introduction to sample size/power calculation for elementary and often encountered research designs in psychology and neuroscience. First, sample size calculation is explained and practiced for comparing two independent samples (e.g. parallel groups or between-subject design) and for comparing two dependent samples (e.g. crossover or within-subject design) on a quantitative dependent variable (outcome). Subsequently, this is extended to a) correlation between two quantitative variables, b) the comparison of two groups on a binary outcome, and c) two-way factorial designs (BS*BS, WS*WS, BS*WS). The opposite effects of a covariate on the sample size needed in randomized and nonrandomized studies are also explained and practiced. Finally, the data analysis and sample size calculation are covered for some popular nested designs, specifically cluster randomized trials and multicenter/multisite trials. Sample size calculations will be done with GPower and possibly some free software for nested designs, and with pencil-and-paper assignments.

Theme 2, Period 4, offered in PSY4163 & PSY4165

Course lecturer: Nick Broers
Structural equation modeling: Structural equation modeling (SEM) is an advanced multivariate method that 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 to longitudinal research and latent variables (factors). Special attention is given to identifying models, 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.
Theme 3, Period 5, offered in PSY4164 & PSY4165
Course Lecturer: Jan Schepers
Resampling methods in statistics: Many modern statistical analyses make use of resampling methods in applications where theoretical statistics cannot readily provide answers for making statistical inferences from the data at hand. This elective provides an introduction to three important resampling methods, bootstrapping, permutation testing and cross- validation, for obtaining measures of accuracy for parameters of a model or for studying model fit. The methods will be practiced using the software R.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to choose the correct formula for computing the sample size for basic and often used research designs, and to compute the sample size with that formula (Theme 1)
Students are able to understand path analysis, structural equation modeling, confirmatory factor analysis, structural models with latent variables, creating and testing SEM models (Theme 2)
Students are able to understand bootstrap sampling, permutation testing, cross-validation, bias, bootstrap confidence interval, bootstrap standard error, prediction error (Theme 3)

Prerequisites

All electives: good understanding of basic and intermediate statistics, including factorial ANOVA and multiple regression
Good working knowledge of R for theme 3: basic programming skils such as for-loops, logical operators, vectors

Applied Statistics II: B

Faculty of Psychology and Neuroscience

PSY4164

Period 4:
2 Feb 2026 **2 Apr 2026**

Credits:
2.0

Coordinator:
J. Schepers

Teaching methods:
Lecture(s), Skills, Assignment(s)

Assessment methods:
Written exam, Attendance, Assignment

Keywords:
sample size, power, structural equation modeling, LISREL, bootstrapping, permutation test, cross-validation

Full course description

Theme 1, Period 4, offered in PSY4163 & PSY4164

Course lecturer: Gerard van Breukelen

Sample size calculation and nested designs: This course provides an introduction to sample size/power calculation for elementary and often encountered research designs in psychology and neuroscience. First, sample size calculation is explained and practiced for comparing two independent samples (e.g. parallel groups or between-subject design) and for comparing two dependent samples (e.g. crossover or within-subject design) on a quantitative dependent variable (outcome). Subsequently, this is extended to a) correlation between two quantitative variables, b) the comparison of two groups on a binary outcome, and c) two-way factorial designs (BS*BS, WS*WS, BS*WS). The opposite effects of a covariate on the sample size needed in randomized and nonrandomized studies are also explained and practiced. Finally, the data analysis and sample size calculation are covered for some popular nested designs, specifically cluster randomized trials and multicenter/multisite trials. Sample size calculations will be done with GPower and possibly some free software for nested designs, and with pencil-and-paper assignments.

Theme 2, Period 4, offered in PSY4163 & PSY4165

Course lecturer: Nick Broers
Structural equation modeling: Structural equation modeling (SEM) is an advanced multivariate method that 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 to longitudinal research and latent variables (factors). Special attention is given to identifying models, 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.
Theme 3, Period 5, offered in PSY4164 & PSY4165
Course Lecturer: Jan Schepers
Resampling methods in statistics: Many modern statistical analyses make use of resampling methods in applications where theoretical statistics cannot readily provide answers for making statistical inferences from the data at hand. This elective provides an introduction to three important resampling methods, bootstrapping, permutation testing and cross- validation, for obtaining measures of accuracy for parameters of a model or for studying model fit. The methods will be practiced using the software R.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to choose the correct formula for computing the sample size for basic and often used research designs, and to compute the sample size with that formula (Theme 1)
Students are able to understand path analysis, structural equation modeling, confirmatory factor analysis, structural models with latent variables, creating and testing SEM models (Theme 2)
Students are able to understand bootstrap sampling, permutation testing, cross-validation, bias, bootstrap confidence interval, bootstrap standard error, prediction error (Theme 3)

Prerequisites

All electives: good understanding of basic and intermediate statistics, including factorial ANOVA and multiple regression
Good working knowledge of R for theme 3: basic programming skils such as for-loops, logical operators, vectors

Applied Statistics II: C

Faculty of Psychology and Neuroscience

PSY4165

Period 4:
2 Feb 2026 **2 Apr 2026**

Credits:
2.0

Coordinator:
J. Schepers

Teaching methods:
Lecture(s), Skills, Assignment(s)

Assessment methods:
Written exam, Attendance, Assignment

Keywords:
sample size, power, structural equation modeling, LISREL, bootstrapping, permutation test, cross-validation

Full course description

Theme 1, Period 4, offered in PSY4163 & PSY4164

Course lecturer: Gerard van Breukelen

Sample size calculation and nested designs: This course provides an introduction to sample size/power calculation for elementary and often encountered research designs in psychology and neuroscience. First, sample size calculation is explained and practiced for comparing two independent samples (e.g. parallel groups or between-subject design) and for comparing two dependent samples (e.g. crossover or within-subject design) on a quantitative dependent variable (outcome). Subsequently, this is extended to a) correlation between two quantitative variables, b) the comparison of two groups on a binary outcome, and c) two-way factorial designs (BS*BS, WS*WS, BS*WS). The opposite effects of a covariate on the sample size needed in randomized and nonrandomized studies are also explained and practiced. Finally, the data analysis and sample size calculation are covered for some popular nested designs, specifically cluster randomized trials and multicenter/multisite trials. Sample size calculations will be done with GPower and possibly some free software for nested designs, and with pencil-and-paper assignments.

Theme 2, Period 4, offered in PSY4163 & PSY4165

Course lecturer: Nick Broers

Structural equation modeling: Structural equation modeling (SEM) is an advanced multivariate method that 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 to longitudinal research and latent variables (factors). Special attention is given to identifying models, 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.

Theme 3, Period 5, offered in PSY4164 & PSY4165

Course Lecturer: Jan Schepers

Resampling methods in statistics: Many modern statistical analyses make use of resampling methods in applications where theoretical statistics cannot readily provide answers for making statistical inferences from the data at hand. This elective provides an introduction to three important resampling methods, bootstrapping, permutation testing and cross- validation, for obtaining measures of accuracy for parameters of a model or for studying model fit. The methods will be practiced using the software R.

The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to choose the correct formula for computing the sample size for basic and often used research designs, and to compute the sample size with that formula (Theme 1)

Students are able to understand path analysis, structural equation modeling, confirmatory factor analysis, structural models with latent variables, creating and testing SEM models (Theme 2)

Students are able to understand bootstrap sampling, permutation testing, cross-validation, bias, bootstrap confidence interval, bootstrap standard error, prediction error (Theme 3)

Prerequisites

All electives: good understanding of basic and intermediate statistics, including factorial ANOVA and multiple regression

Good working knowledge of R for theme 3: basic programming skils such as for-loops, logical operators, vectors

Pharmacoepidemiology, Drug Safety & Pharmaceutical Policy

Faculty of Psychology and Neuroscience

PSY4816

Period 4:
2 Feb 2026 **2 Apr 2026**

Credits:
4.0

Coordinator:
J.T.H. NielenJ.H.M. Driessen

Teaching methods:
PBL, Lecture(s)

Assessment methods:
Written exam, Attendance

Keywords:
Pharmacoepidemiology, drug safety, pharmaceutical policy

Full course description

When a new medicine is granted a marketing authorization, its clinical safety profile has been assessed based on the results from randomised clinical trials (RCTs). The number of patients recruited for these pre-marketing (Phase-III) trials (in general up to 3,000), is able to detect adverse events that occur with frequencies of up to 1:1000 patient-years. Therefore, it is difficult to assess adequately the risk/benefit profile of a drug for regulatory authorities, such as the US Food and Drug Administration (FDA) or the European Medicines Agency (EMA). The authorities will ultimately decide whether a drug can remain on the market, whether its use will be restricted to certain subgroups of patients or whether it will be entirely pulled off the market. This problem is further enhanced by exclusion criteria for patients enrolled in RCTs, and their short duration of follow-up (generally several months up to 2-3 years). The intake of other medications or inclusion of children, elderly or pregnant women- such as in a real life setting - is often not allowed in RCTs. As a result, the EMA and FDA usually request pharmaceutical companies to conduct so called post-authorisation safety (PASS) studies. Similar studies are also conducted by other stakeholders such as academia or drug regulators such as the FDA.

This course will give an overview of the lifecycle of drug development, with a strong emphasis on pharmacoepidemiology in Phase IV research. It will evaluate stakeholders, legislation scientific

methods and commonly used data sources to assess the risk-benefit profile of drugs after market authorisation.

The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- the latest developments of the regulatory process of drug development (Phase I-IV);
- common and novel pharmacoepidemiological methods for the conduct of post-authorisation safefty studies (PASS). These include meta-analysis, case-control studies, cohort studies, and case-only methods;
- commonly used datasources for the conduct of Phase IV research, inlcuding their strengths and limitations;
- risk/benefit assessments by regulatory agencies; pharmacovigilance procedures;
- the interactions between patients, prescribers, and payers (health insurance companies and governments).

Clinical Development

Faculty of Psychology and Neuroscience

PSY4820

Period 4:
2 Feb 2026 **2 Apr 2026**

Credits:
4.0

Coordinator:
P.R.A. HeckmanR. Schreiber

Teaching methods:
PBL, Lecture(s), Assignment(s), Presentation(s)

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
drug development, phase I, phase II, phase III, phase IV, proof of concept, dose finding, biomarkers, outcomes, trial design, repurposing/repositioning

Full course description

Students will become acquainted with the concept of a clinical development plan and the critical path of studies in early and late development.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- target product profile, single ascending dose studies, multiple ascending dose studies, experimental medicine studies, dose finding, proof of concept, efficacy, safety;
- phases of clinical development (I-III) and special cases, i.e. development of anti-cancer drugs and biologicals as models for drug development in neuroscience;
- role of biomarkers in patient stratification, target engagement and outcome/efficacy prediction;
- novel trial formats, e.g. adaptive trials, single-case observations, non-Bayesian statisticstransdiagnostic approaches;
- relevant outcome parameters versus surrogate parameters;
- recent cases of development failures and reasons;
- drug repurposing and repositioning;
- development pipelines.

Biomedical Brain Imaging

Faculty of Psychology and Neuroscience

PSY4832

Period 4:
2 Feb 2026 **2 Apr 2026**

Credits:
3.0

Coordinator:
D.M.J. Hernaus

Teaching methods:
PBL, Lecture(s), Work in subgroups, Presentation(s)

Assessment methods:
Presentation, Attendance

Keywords:
biomedical imaging, drug development, PET, SPECT, MRS, ph-MRI

Full course description

Neuroimaging techniques provide powerful insights into the distribution, binding, and other biological effects of pharmacological agents. For example, positron emission tomography can be used to directly assess the relationship between drug plasma concentration and target occupancy. Neuroimaging thus enables the possibility to test whether a new chemical entity reaches brain target tissue in sufficient amounts to be pharmacologically active, and to alter disease processes. This workshop will focus on how and whether neuroimaging techniques can yield biomarkers and surrogate endpoints that can aid the prediction of disease progression and (treatment) outcome. The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Using the available literature, student presentations, and lectures, students will be able to understand and explain:

- the basic principles of various brain imaging methods (PET, SPECT, MRI, fMRI, MRS);
- how these approaches are typically used in clinical drug development stages (target identification, distribution, pharmacokinetics, target binding, drug efficacy, safety, personalized medicine);
- opportunities and challenges of biomedical imaging techniques during the different phases of drug development.

Electrophysiology: From Single Cell Activity to ‘Cognitive’ Markers

Faculty of Psychology and Neuroscience

PSY4322

Period 5:
7 Apr 2026 **5 Jun 2026**

Credits:
4.0

Coordinator:
L.K. Goller

Teaching methods:
PBL, Lecture(s)

Assessment methods:
Written exam, Attendance

Keywords:
electrophysiology, signal transduction, patch clamp, single cell recording, electroencephalography, Translational Neuroscience

Full course description

Our brain is busy all the time, whether we are awake or asleep. There are thousands of neurons which are in constant communication with each other. Neurotransmitters and electrical currents convey information from one cell to another, which in turn produces electrical signals that we can measure. This course is an introduction into the field of electrophysiology. Students first learn about how currents develop (i.e., role of molecules, ion channels and membrane) and how they can be measured in individual neurons (e.g., patch clamp or single cell recording), groups of neurons (local field potentials) and brain regions (electroencephalography). Students further examine differences in measurements across species. For instance, can electrodes be placed in humans using the same approach used for rats? Finally, students will learn how to interpret these currents in terms of event-related potentials, (de)synchronisation and functional connectivity measures. In addition to the theoretical basis, students will discuss some of the practical issues when performing electrophysiological recordings, such as measurement settings and electrode positions, and applications of electrophysiology in psychopharamacology and neurological disorders.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students:

- can explain neuronal electrochemical processes, patch clamp measurements and single neuron recording techniques;
- have basic understanding of how EEG is measured;
- can interpret event-related potentials from different species, EEG frequencies, event-related (de)synchronisation, and source localization;
- can design electrophysiological studies with a link to (psycho)pharmacology and neurological disorders.

Practical Training: Western Blotting: A Pharmacological Perspective

Faculty of Psychology and Neuroscience

PSY4823

Period 5:
7 Apr 2026 **5 Jun 2026**

Credits:
0.0

Coordinator:
R.J.M. RiemensG.R.L. Kenis

Teaching methods:
Lecture(s), Skills, Paper(s), Assignment(s), Research, Presentation(s)

Assessment methods:
Final paper, Attendance, Assignment

Keywords:
Western blot, stress, depression, anxiety disorders, neurotrophic factors, Anxiety disorders

Full course description

The objective of this practical is to learn the principles of working with in-vitro model systems and to use Western Blotting to measure protein levels. After an introduction, students will design their own small research project. During the entire course, students work on this project and conduct the necessary experiments. Students use human cell lines to examine the neuroplastic/toxic effects of stress hormones (e.g. cortisol) in relation to molecular biological changes. The effects on neurotrophic factor signaling are determined by Western Blotting.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:
western blotting, cell culture, neuroplasticity, psychopharmacology, protein chemistry, psychobiology of stress, neurobiology of psychiatric disorders, anxiety, anxiety disorders, major depression, molecular psychiatry, environmental exposure, functional neuroanatomy, (neuro)psychiatric (endo)phenotypes, animal models for psychiatric disorders, translational neuropsychiatry, the pathophysiology of mental disorders.

Psychiatric Neuroscience: Psychopharmacology

Faculty of Psychology and Neuroscience

PSY4841

Period 5:
7 Apr 2026 **5 Jun 2026**

Credits:
4.0

Coordinator:
S.E. PishvaG.R.L. KenisD.L.A. van den Hove

Teaching methods:
PBL, Lecture(s), Assignment(s), Work in subgroups, Presentation(s)

Assessment methods:
Written exam, Presentation, Attendance

Keywords:
stress, depression, Anxiety disorders, panic disorder, schizophrenia, gene-environment, anxiety disorders

Full course description

The main aim of this course is to gain insights into the molecular neurobiology of psychiatric disorders and how these phenotypes can be studied in animal models (i.e. the principle of translation). The first part of this course focuses on the psychobiology of stress, emotions and associated disorders such as depression and anxiety disorders. Chronic and/or excessive stress may lead to the development of psychiatric conditions such as depression and anxiety, diseases in which a 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. A major focus during the course is on the limbic system, the sympathetic nervous system and the hypothalamo-pituitary-adrenal axis as key players of emotional regulation in health and disease. Furthermore, the roles of different neurotransmitter systems such as the serotonergic system will be discussed in depth. The second part of the course deals with the neurobiology of major psychotic disorders such as schizophrenia. In particular, this course addresses the molecular processes that influence psychosis-related cognitive domains from a translational point of view. Students will also study the mechanisms by which adverse environmental exposures de-regulate key brain structures

that influence the mesocorticolimbic dopaminergic system - a core phenomenon in psychosis pathophysiology.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:
psychobiology of stress, neurobiology of psychiatric disorders, anxiety, anxiety disorders, panic disorder, major depression, psychosis, schizophrenia, molecular psychiatry, gene-environment (GxE) interactions, environmental exposure, functional neuroanatomy, (neuro)psychiatric (endo)phenotypes, animal models for psychiatric disorders, translational neuropsychiatry, the pathophysiology of mental disorders, hypothalamic-pituitary-adrenal axis, mesocorticolimbic system.

Research Grant Writing Workshop

Faculty of Psychology and Neuroscience

PSY4114

Period 6:
8 Jun 2026 **3 Jul 2026**

Credits:
2.0

Coordinator:
R.L.H. HandelsS. Köhler

Teaching methods:
Lecture(s), Skills, Assignment(s), Work in subgroups

Assessment methods:
Final paper, Attendance

Keywords:
Funding possibilities, grant applications, academic writing, team science

Full course description

Research is expensive. Finding appropriate funding sources and writing a convincing grant application is therefore a core comptency of scientists. During this workshop, students will learn why and how to apply for research grants and they will be taught academic writing skills. The need for acquiring funding for research, the opportunities for, and availability of grant application funding will be discussed. Students will start by chosing a topic (from a list of topics) and write an abstract on their research idea. Subsequently, they work in teams to discuss individual ideas and decide on a joint research idea that will serve as a basis for writing a full grant proposal during the second-year Research Grant Writing Course with guidance of a mentor (see description of PSY5112). Mentors are researchers from all RM tracks who have experience in applying for different types of grants and will provide students with first-hand knowledge and tips. Students will learn fundamentals of good grant writing, general preparation of the grant application and how to deal with reviewer comments. Ethical issues including feasibility and acceptability of the research, and the role of the local research ethics committee will be discussed.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

- students will acquire skills on general academic writing as well as grant writing

- students will learn about the importance of grant writing for an academic career;
- students will recognize opportunities for funding, ethical aspects of grants and how grants can be acquired;
- students will develop a first outline of a grant proposal with peers.

Neuropsychopharmacology

Faculty of Psychology and Neuroscience

PSY4415

Period 6:
8 Jun 2026 **3 Jul 2026**

Credits:
3.0

Coordinator:
J.G. Ramaekers

Teaching methods:
PBL

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
drug action, psychopharmacology of CNS disorders, behavioural toxicity

Full course description

This course addresses the influence of drugs upon normal functioning and on disease states. Neurobiological and neurochemical mechanisms are presented with the aim to deepen insight into the various mechanisms of drug action. The course will review major classes of drugs that are used frequently in the treatment of mental disorders and neurological disease, but also other classes of drugs that have side effects on the central nervous system. Other topics in this course are behavioural toxicology, experimental designs used in treatment studies, drugs of abuse and recreational drugs.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand neurobiology of drugs and mental disorders.

Prerequisites

Students will be able to understand neurobiology of drugs and mental disorders.

Research Grant Writing Course

Faculty of Psychology and Neuroscience

PSY5112

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
3.0

Coordinator:
R.L.H. HandelsS. Köhler

Teaching methods:
Skills, Assignment(s), Work in subgroups

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
grant proposal, interdisciplinary, hypothesis, design, methods, research symposium, Interdisciplinary

Full course description

Research is expensive. Finding appropriate funding sources and writing a convincing application is therefore a core comptenency of scientists. In this course, students will apply what they have learned during the Research Grant Writing Workshop (PSY4114) by going through a full grant proposal writing and review process. Students will work together (groups of 4-6 students) to write a joint research proposal as group on their selected topic, including an original research hypothesis, design, methods, motivation and valorization. Students are encouraged to think across boundaries of different scientific fields. A mentor (senior researcher) will guide students during this writing process. The students will write their proposal in 3 steps, and they will receive feedback from their mentor and peers along the way. The resulting grant proposals will be reviewed by two assessors and presented during a symposium by way of a group-based oral presentation.

The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to:

- review literature;

- formulate a research hypothesis;
- design a innovative research study;
- write a competitive grant proposal;
- present and illustrate a grant proposal at a symposium.

Prerequisites

This course is a continuation of the Research Grant Writing Workshop (PSY4112).

Behavioural Tests and Models

Faculty of Psychology and Neuroscience

PSY5332

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
1.0

Coordinator:
D.L.A. van den Hove

Teaching methods:
Skills, Paper(s), Work in subgroups, Presentation(s)

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
Test, model, in vivo, validity, translation

Full course description

As a neuroscientist, you will encounter behavioral animal experiments e.g. by working with animals or behavioral animal datasets yourself, or by reading publications that involve behavioral animal studies. Within the neuroscientific field, pre-clinical research still largely involves animal experiments, and such experiments require many considerations:
- Which models and tests are available and which should I use to answer my research question?
- What are the criteria for choosing the right model or test?
- How does this translate to a human situation?

Most importantly, behavioral animal experiments are a very careful balance between science and ethics to translate your research most optimally to a human situation.
The final assessment for this course is pass or fail - and not a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:
- Concepts of behavioral animal testing
- How to critically interpret and analyze behavioral results
- How to report animal studies in scientific journals, including ethical considerations

Applied Therapeutics

Faculty of Psychology and Neuroscience

PSY5812

Period 1:
1 Sep 2025 **24 Oct 2025**

Credits:
3.0

Coordinator:
P.K.C. Janssen

Teaching methods:
PBL

Assessment methods:
Final paper, Presentation, Attendance

Keywords:
clinical pharmacology, pharmacotherapeutics

Full course description

This course addresses prevalence of psychiatric disorders and the use of psychotropic drugs. The students will be presented pharmacotherapeutic data of several drugs, necessary to start a therapeutic regimen for individual patients. Clinical pharmacological knowledge will be applied to several cases within different drug groups, i.e. cardiac and CNS drugs, with the objective to maximize drug effects while minimizing side effects (i.e. movement, cardiovascular, sexual and CNS side effects). The influence of genetic polymorphisms and drug-drug interactions on patient dependent drug choice and treatment adherence.
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students will be able to understand:

- the epidemiology of psychiatric diseases and CNS drugs in the general population;
- pharmacokinetic and pharmacodynamics properties of CNS drugs, including genetic polymorphisms;
- how to translate clinical pharmacological concepts into pharmacotherapy of psychiatric diseases.

Research Proposal

Faculty of Psychology and Neuroscience

PSY5107

Year:
1 Sep 2025 **31 Aug 2026**

Credits:
1.0

Coordinator:
G.C. Kraag

Teaching methods:
Skills, Paper(s), Assignment(s), Research

Assessment methods:
Final paper, Participation, Attendance, Oral exam, Observation

Keywords:
research project, research, master's thesis

Full course description

The second part of the second year of the research master's programme is devoted to conducting a master thesis research projectinternship. As a result of the many international research contacts that faculty members have established, a substantial number of students will conduct their master thesis research projectinternship abroad. Students start their masterthesis research projectinternship with the writing of a research proposal. Students finish the master's programme by writing a thesis based on their master thesis research projectinternship and orally defending their thesis.

The master thesis research projectinternship can be completed at Maastricht University or at external research institutes. In all cases, a student's research proposal and master's thesis will be evaluated by two assessors. At least one of these assessors must be a member of the Faculty of Psychology and Neuroscience (FPN), the Faculty of Health, Medicine and Life Sciences (FHML), or the School of Business and Economics (SBE). Both assessors must hold a PhD degree.

A detailed guide on master thesis research projectinternship and the master's thesis can be found on the student-intranet.

Each specialisation has its own internship/research project coordinator:

- *RM Cognitive Neuroscience:*

Lars Hausfeld, Cognitive Neuroscience (FPN), Phone: (0) 43 38 84521,
55 Oxfordlaan, Room S.1.018, Email: lars.hausfeld@maastrichtuniversity.nl

- *RM Fundamental Neuroscience:*

Pilar Martínez, Psychiatry and Neuropsychology (FHML), Phone: (0)43 38 81042,
40 Universiteitssingel, Room 2.574, Email: p.martinez@maastrichtuniversity.nl

- *RM Neuropsychology:*

Michael Schwartze, Neuropsychology and Psychopharmacology (FPN),
Phone (043) 38 82802, 40 Universiteitssingel, Room A2.765,
Email: michael.schwartze@maastrichtuniversity.nl
For the clinical part:
Ieke Winkens, Neuropsychology and Psychopharmacology (FPN),
Phone (043) 38 84512, 40 Universiteitssingel, Room A2.759,
Email: fpn-np-internship@maastrichtuniversity.nl

- RM Clinical Psychology:

Nicole Geschwind, Clinical Psychological Science (FPN), Phone (043) 38 81487,
40 Universiteitssingel, Room 2.767, Email: nicole.geschwind@maastrichtuniversity.nl

- RM Drug Development and Neurohealth:

Jacco Briedé, Toxicogenomics, Phone (043)3881094,
50 Universiteitssingel, Room 4.114, Email: j.briede@maastrichtuniversity.nl
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to understand and apply:
- conducting a (supervised) empirical research project and summarising the research and findings in the form of a master's thesis.
- In a correct and transparent manner GenAI or LLM's, like ChatGPT

Prerequisites

The master thesis research projectinternship cannot be started until:

- at least 5460 credits have been attained during the programme;
- the above mentioned 5460 credits must include the courses Advanced Statistics I and II.

Master's Thesis Research Project Graded

Faculty of Psychology and Neuroscience

PSY5120

Year:
1 Sep 2025 **31 Aug 2026**

Credits:
10.0

Coordinator:
G.C. Kraag

Teaching methods:
Skills, Paper(s), Assignment(s), Research

Assessment methods:
Final paper, Participation, Attendance, Oral exam, Observation

Keywords:
research project, research, master's thesis

Full course description

The second part of the second year of the research master's programme is devoted to conducting a master thesis research projectinternship. As a result of the many international research contacts that faculty members have established, a substantial number of students will conduct their master thesis research projectinternship abroad. Students start their masterthesis research projectinternship with the writing of a research proposal. Students finish the master's programme by writing a thesis based on their master thesis research projectinternship and orally defending their thesis.

The master thesis research projectinternship can be completed at Maastricht University or at external research institutes. In all cases, a student's research proposal and master's thesis will be evaluated by two assessors. At least one of these assessors must be a member of the Faculty of Psychology and Neuroscience (FPN), the Faculty of Health, Medicine and Life Sciences (FHML), or the School of Business and Economics (SBE). Both assessors must hold a PhD degree.

A detailed guide on master thesis research projectinternship and the master's thesis can be found on the student-intranet.

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- RM Clinical Psychology:

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40 Universiteitssingel, Room 2.767, Email: nicole.geschwind@maastrichtuniversity.nl

- RM Drug Development and Neurohealth:

Jacco Briedé, Toxicogenomics, Phone (043)3881094,
50 Universiteitssingel, Room 4.114, Email: j.briede@maastrichtuniversity.nl
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to understand and apply:
- conducting a (supervised) empirical research project and summarising the research and findings in the form of a master's thesis.
- In a correct and transparent manner GenAI or LLM's, like ChatGPT

Prerequisites

The master thesis research projectinternship cannot be started until:

- at least 5460 credits have been attained during the programme;
- the above mentioned 5460 credits must include the courses Advanced Statistics I and II.

Master's Thesis Research Project Ungraded

Faculty of Psychology and Neuroscience

PSY5121

Year:
1 Sep 2025 **31 Aug 2026**

Credits:
25.0

Coordinator:
G.C. Kraag

Teaching methods:
Skills, Paper(s), Assignment(s), Research

Assessment methods:
Final paper, Participation, Attendance, Oral exam, Observation

Keywords:
research project, research, master's thesis

Full course description

The second part of the second year of the research master's programme is devoted to conducting a master thesis research projectinternship. As a result of the many international research contacts that faculty members have established, a substantial number of students will conduct their master thesis research projectinternship abroad. Students start their masterthesis research projectinternship with the writing of a research proposal. Students finish the master's programme by writing a thesis based on their master thesis research projectinternship and orally defending their thesis.

The master thesis research projectinternship can be completed at Maastricht University or at external research institutes. In all cases, a student's research proposal and master's thesis will be evaluated by two assessors. At least one of these assessors must be a member of the Faculty of Psychology and Neuroscience (FPN), the Faculty of Health, Medicine and Life Sciences (FHML), or the School of Business and Economics (SBE). Both assessors must hold a PhD degree.

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- *RM Fundamental Neuroscience:*

Pilar Martínez, Psychiatry and Neuropsychology (FHML), Phone: (0)43 38 81042,
40 Universiteitssingel, Room 2.574, Email: p.martinez@maastrichtuniversity.nl

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The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to understand and apply:
- conducting a (supervised) empirical research project and summarising the research and findings in the form of a master's thesis.
- In a correct and transparent manner GenAI or LLM's, like ChatGPT

Prerequisites

The master thesis research projectinternship cannot be started until:

- at least 5460 credits have been attained during the programme;
- - the above mentioned 5460 credits must include the courses Advanced Statistics I and II.

Master's Thesis

Faculty of Psychology and Neuroscience

PSY5103

Year:
1 Sep 2025 **31 Aug 2026**

Credits:
14.0

Coordinator:
G.C. Kraag

Teaching methods:
Skills, Paper(s), Assignment(s), Research

Assessment methods:
Final paper, Participation, Attendance, Oral exam, Observation

Keywords:
research project, research, master's thesis

Full course description

The second part of the second year of the research master's programme is devoted to conducting a master thesis research projectinternship. As a result of the many international research contacts that faculty members have established, a substantial number of students will conduct their master thesis research projectinternship abroad. Students start their masterthesis research projectinternship with the writing of a research proposal. Students finish the master's programme by writing a thesis based on their master thesis research projectinternship and orally defending their thesis.

The master thesis research projectinternship can be completed at Maastricht University or at external research institutes. In all cases, a student's research proposal and master's thesis will be evaluated by two assessors. At least one of these assessors must be a member of the Faculty of Psychology and Neuroscience (FPN), the Faculty of Health, Medicine and Life Sciences (FHML), or the School of Business and Economics (SBE). Both assessors must hold a PhD degree.

A detailed guide on master thesis research projectinternship and the master's thesis can be found on the student-intranet.

Each specialisation has its own internship/research project coordinator:

- *RM Cognitive Neuroscience:*

Lars Hausfeld, Cognitive Neuroscience (FPN), Phone: (0) 43 38 84521,
55 Oxfordlaan, Room S.1.018, Email: lars.hausfeld@maastrichtuniversity.nl

- *RM Fundamental Neuroscience:*

Pilar Martínez, Psychiatry and Neuropsychology (FHML), Phone: (0)43 38 81042,
40 Universiteitssingel, Room 2.574, Email: p.martinez@maastrichtuniversity.nl

- *RM Neuropsychology:*

Michael Schwartze, Neuropsychology and Psychopharmacology (FPN),
Phone (043) 38 82802, 40 Universiteitssingel, Room A2.765,
Email: michael.schwartze@maastrichtuniversity.nl
For the clinical part:
Ieke Winkens, Neuropsychology and Psychopharmacology (FPN),
Phone (043) 38 84512, 40 Universiteitssingel, Room A2.759,
Email: fpn-np-internship@maastrichtuniversity.nl

- RM Clinical Psychology:

Nicole Geschwind, Clinical Psychological Science (FPN), Phone (043) 38 81487,
40 Universiteitssingel, Room 2.767, Email: nicole.geschwind@maastrichtuniversity.nl

- RM Drug Development and Neurohealth:

Jacco Briedé, Toxicogenomics, Phone (043)3881094,
50 Universiteitssingel, Room 4.114, Email: j.briede@maastrichtuniversity.nl
The final assessment for this course is a numerical grade between 0,0 and 10,0.

Course objectives

Students are able to understand and apply:
- conducting a (supervised) empirical research project and summarising the research and findings in the form of a master's thesis.
- In a correct and transparent manner GenAI or LLM's, like ChatGPT

Prerequisites

The master thesis research projectinternship cannot be started until:

- at least 5460 credits have been attained during the programme;
- the above mentioned 5460 credits must include the courses Advanced Statistics I and II.

Master’s Thesis Oral Inquiry

Faculty of Psychology and Neuroscience

PSY5124

Year:
1 Sep 2025 **31 Aug 2026**

Credits:
0.0

Coordinator:

Teaching methods:

Assessment methods:

Keywords:

Full course description

Course objectives

Recommended reading