

Teaching and Examination Regulations

Master's Degree Program

B. program-specific section

M Neurosciences (60806)

Academic year 2015-2016

Section B: Program-specific section

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Section B: Program-specific section

1. General provisions

Article 1.1 Definitions

Not applicable

Article 1.2 Degree program information

1. The research master program Neurosciences CROHO number 60806 is offered on a full-time basis and the language of instruction is English.
2. The program has a workload of 120 EC.
3. A unit of study comprises 6 EC or a multiple thereof.
4. The following units of study are different in size:
3 ECTS: AM_1123 Writing a research proposal,
3 ECTS: AM_1018 Neurophilosophy and ethics,
8 ECTS: AM_471110 Literature Survey
27 ECTS: AM_471108 Internship Neurosciences I
25 ECTS: AM_471108 Internship Neurosciences II

Article 1.3 Intake dates

The program is offered starting in the first semester of the academic year (1 September). The intake date(s) mentioned in this paragraph ensure(s) that a program can be completed within the nominal study duration set for the program.

2. Program objectives and exit qualifications

Article 2.1 Program objective

The program aims to train students to become neuroscientists that are able to independently conduct neuroscientific research. Students will acquire the required knowledge, insight and skills related to neurosciences, as well as the academic skills including a critical disposition, insight in societal and ethical aspects of neuroscience research.

Article 2.2 Exit qualifications

Graduates of the research master of Neurosciences have an academic attitude and are academically skilled researchers in the field of Neurosciences. Neuroscience Master graduates are able to:

- independently acquire information and data in the field of neurosciences, and to analyze and critically evaluate these data;
- select and structure information, distinguish essentials from trivialities, and associate distinct data;
- think in multidisciplinary terms, and have an understanding of other disciplines (and sub-disciplines) that are important to their own specialism;
- independently and critically analyze research, both in relation to its design and execution, and to the results obtained;
- draw up a research plan, with details of experimental design, execution and analysis;
- produce written reports and verbal presentations of the research, in English;
- apply knowledge of neuroscience to social questions;
- make an intrinsic contribution to scientific discussions relating to planned research and to discussions of research results;
- evaluate their own performance, both introspectively and in conversation with others;
- reflect on the ethical aspects of research or its uses, and include these deliberations in the decision-making process.

Knowledge

- mastery of the field's conceptual framework, understanding of the state of the art in terms of developing theories and insight into the most important current research issues in the neurosciences

- appreciation of the position of Neurosciences within biology, the biomedical sciences, medicine and psychology;
- familiarity with the most relevant sources of information and data (and in the use of such sources) in the field of the natural sciences in general and of the neurosciences in particular;
- appreciation of the scientific and social relevance of the neurosciences and of current research in this area.

Skills

- understand, summarize and provide an insightful overview of neuroscience literature
- design and execute neuroscientific experiments;
- collaborate with researchers from other disciplines;
- familiarity with computer software that is relevant to the field.

3. Additional admission requirements

Article 3.1 Admission requirements

Research master

1. Admission to the Research Master program of Neurosciences is possible for an individual who can demonstrate that he/she has the following knowledge, understanding and skills at the Bachelor's degree level, obtained at an institution of academic higher education:
 - a) knowledge: knowledge of basic neurobiological principles, statistics
 - b) understanding: understanding of these principles
 - c) skills: well-developed academic skills including writing and presentation skills, the ability to evaluate and apply knowledge, and engage in critical thinking.
2. The Admissions Board will determine whether the applicant meets the admission requirements.
3. In addition to the requirements referred to in the first paragraph, the Board will also assess requests for admission according to the following criteria:
 - d) talent and motivation; applicants should have an active interest in neuroscience research and have clear ideas about their scientific careers .In addition, the applicant should have obtained high grades and have performed at above average level:
 1. minimum undergraduate grade-point average of 7.5 (or international equivalent, e.g. a B+, or a GPA of 3.4).
 2. A minimum grade of 8 (or international equivalent, e.g. an A, or a GPA of 4.0, for both the Bachelor's thesis and neuroscience-related courses.
4. A student can only enter the research master program of Neurosciences after successful completion of a bachelor program.

Article 3.2 Pre-Master's program

Not applicable

Article 3.3 Limited program capacity

1. The program accepts a maximum of 40 students per year.
2. Candidates will be selected in the following way:
 - The applicant provides his/her CV, grade list, BSc diploma (if already obtained), a motivation letter, two reference letters, and the results of an English language proficiency test. Once the applicant has provided all necessary documents, the admissions board carefully reads and evaluates all information provided by the applicant and then determines whether the candidate meets the admission requirements (article 3.1). When the information in these documents indicates that the applicant meets the admission requirements, the applicant will be invited for an interview to assess the applicant's motivation.
 - The final decision on admission or rejection to the Research Master program of Neurosciences, will be based on an evaluation of the applicant's motivation revealed during this interview. In all cases, decisions will be made within 6 weeks after application.

- The board holds the right to deviate from the specific admission requirements when exceptional circumstances apply. If the applicant believes that his/her case is subject to such exceptional circumstances, this should be explained in the letter of application.
- The admission criteria are published on the VU website:
<http://www.vu.nl/nl/opleidingen/masteropleidingen/opleidingenoverzicht/m-o/neurosciences/admission-and-application/index.asp>

Article 3.4 Final deadline for registration

A candidate must submit a request to be admitted to the program through Studielink before the dates that are determined in the Application and Registration Regulation (at <http://www.vu.nl/en/programs/practical/policies/index.asp>). Under exceptional circumstances, the Examinations Board may consider a request submitted after this closing date.

Article 3.5 English language requirement for English-language Master programs

1. The proficiency requirement for the English language can be met by the successful completion of one of the following examinations or an equivalent:
 - IELTS: 6.5 - *please note that candidates must take the **Academic** test and not the General one!*
 - TOEFL paper-based test: 580
 - TOEFL computer-based test: 237
 - TOEFL Internet-based test: 92-93
 - Cambridge Certificate in Advanced English (CAE): A, B, C
 - Cambridge Certificate of Proficiency in English (CPE): A, B, C2.

Exemption is granted from the examination in English referred to in the first paragraph to students who, within two years of the start of the program

- met the requirements of the VU test in English language proficiency TOEFL ITP, with at least the scores specified in paragraph 1, or
- had previous education in secondary or tertiary education in an English-speaking country as listed on the website, or
- have an English-language 'international baccalaureate' diploma, or
- have obtained a BSc degree with a curriculum entirely taught in English

Article 3.6 Free choice curriculum

1. Subject to certain conditions, the student has the option to obtain 6 EC outside the regular curriculum of his/her own choice.
2. The concrete details of such curriculum choice must be approved beforehand by the most appropriate Examinations Board.
3. The free choice curriculum (6 EC) is chosen by the student from the units of study offered by a Dutch university offering a Masters Neurosciences or Psychology program and must at least have the quality and level of the regular curriculum.
4. The following conditions must at least have been met in order to be eligible for the Master degree:
 - a. at least 114 EC must be obtained from the regular curriculum,
 - b. the level of the program must match the objectives and exit qualifications that apply for the program for which the student is enrolled.

4. Curriculum structure

Article 4.1 Composition of program

1. The program consists of the following components:
 - a. compulsory units of study: From molecule to mind (12 EC), Clinical neurosciences (6 EC), Behavioural genetics (6 EC), Neurogenomics (6 ECTS), Writing a research proposal (3 EC), Neurophilosophy and ethics (3 EC), Literature survey (8 EC);
 - b. practical exercise Internship 1 (27 EC), Internship 2 (25 EC);
 - c. electives at least 3 of the 4 electives in the first semester of year 2 (6 EC per course, 18 EC minimum):
Advanced neurogenomics, or
Psychophysiology, or
Advanced clinical neuroscience.
Followed by:

Live cell imaging, or
 Methods in behavioral neuroscience, or
 Statistical Genetics for Gene Finding, or
 Functional brain imaging
 followed by:
 Developmental neurobiology, or
 Neuronal networks in vivo, or
 Complex trait genetics, or
 Neuroendocrinology
 Followed by:
 Genomic data analysis, or
 Advanced human neurophysiology, or
 System neurosciences, or
 Neuro- and psychopharmacology

Article 4.2 Compulsory units of study

The compulsory units of study are:

Year 1

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
From Molecule to Mind	AM_1004	12	1	lectures, computer labs, brain dissection lab rotation	Written progress exam: 10% of final grade. Written final exam: 90% of final grade	400
Clinical neurosciences	AM_1005	6	2	Lectures self-study	Written exam consisting of open-end questions	400
Behavioral Genetics	AM_1006	6	2	Lectures and computer practicals (Written exam consisting of open-end questions (60%) + writing assignment (40%). Students need to pass both parts (grade > 5.5) to obtain final grade.	400
Neurogenomics	AM_1007	6	3	Lectures, student presentations, topical workshops, literature study	Written exam, presentations	500
Writing a Research Proposal	AM_1123	3	2	Writing excercises	class participation and all assignments.	400
Internship Neurosciences I	AM_471108	27	4,5,6,3,2,1	Student writes research proposal, conducts neuroscientific experiments, analyses data, writes a report	Research proposal 6 weeks after start internship final assessment consists of: attitude &	600

				and presents and discusses the data in the research group (incl. formative assessment)	execution (25%), oral presentation (25%), written report (50%; 25% assessor 1, 25% assessor2)	
Year 2: Neurophilosophy and Ethics	AM_1018	3	3	Interactive lectures, video, discussion of the literature, 'Lagerhuys debate', pitching	Oral presentation (1/3 of the final grade). Final paper (2/3 of final grade	500
Year 2; Internship Neurosciences II	AM_471109	25	4,5,6,3,2,1	Student writes research proposal, conducts neuroscientific experiments, analyses data, writes a report and presents and discusses the data in the research group (incl. formative assessment)	Research proposal 6 weeks after start internship final assessment consists of: attitude & execution (25%), oral presentation (25%), written report (50%; 25% assessor 1, 25% assessor2)	600
Year 2: Literature Survey Neurosciences	AM_471110	8	1,2,3,4,5,6	Student writes a literature review (incl. formative feedback from VU supervisor)	Final assessment: assessor 1: 50% (writing process + report + oral presentation), assessor 2: 50% (report)	600

Optional courses year 2

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Advanced neurogenomics	AM_470717	6	1	Lectures, discussion of papers, demonstrations, practicals presentations and discussion, self study	Written examination, 2 oral presentations, performance during the practical work and during (plenary) discussions.	600
Psycho-physiology	AM_470736	6	1	Lectures, practicals, self-study: 70h	Written examination (50% of grade) , independent performance (20%)	500

					presentation (30%).	
Advanced clinical neuroscience	AM_1014	6	1	Lectures, writing a research proposal in small groups, rotation in the clinic, self study.	General attitude during the course. Written Research proposal. Oral Presentation of research proposal	600
Live cell imaging	AM_470726	6	1	Lectures and Masterclass meetings with experts in the field. Hands-on experiments in the lab in small groups.	Oral presentations (50%) and Mid-term Exam (50%). Students need to pass both parts (grade > 5.5) to obtain final grade.	500
Methods in behavioral neuroscience	AM_470728	6	1	Lectures/demonstrations with discussion	Student presentation and written examination with open-ended questions	500
Complex trait genetics	AM_470733	6	2	Combined lectures and work groups,	Written exam	500
Functional brain imaging	AM_470715	6	1	Lectures (almost full-time, attendance is required). Small group discussions, visits to the departments involved in imaging, computer practicals. Writing of an individual essay.	Individual essay (50%). Team presentation (50%).	500
Developmental neurobiology	AM_470713	6	2	Lectures, seminars, master classes from experts in the field and hands-on training, student presentations	Written mid-term exam (40%). Oral presentation of seminar task (30%). Oral presentation of lab work (30%). Students need to pass both parts (grade >	500

					5.5) to obtain final grade.	
Neuronal networks in vivo	AM_1001	6	2	Plenary lectures, literature discussions, demonstrations and workshops.	Exam, participation in discussions and workshops, presentation . All components have to be passed.	600
Statistical genetics for gene finding	AM_470734	6	1	Lectures, practical hands-on computer training.	Written exam	500
Neuro-endocrinology	AM_470700	6	2	Lectures, Outpatient clinics, Research tutorials	Written exam	500
Genomic data analysis	AM_1008	6	2	Lectures (20 hr), practicals (15 hr)	Written exam (60%), microarray data analysis assignment (20%), sequence analysis assignment (20%)	500
Advanced human neurophysiology	AM_1003	6	2	Lectures, self study, lab experiments: data collection under supervision, EEG/ERP data analysis and computer practicals, group discussions (journal club preparation), plenary discussions preparation of poster and presentation	presentation of data on research poster (40%). Written examination (60%).	600
System neurosciences	AM_470712	6	2	Homework assignments, presentations, and tutored discussions (masterclass).	Self-study with evaluations by way of presentations and discussions; final thesis on a self-selected topic.	500
Neuro- and psycho-	AM_470718	6	2	Lectures, progression	Exam (1/4 of final grade),	600

pharmacology				meeting with supervisor, writing a thesis and preparing presentation	writing (1/2 of final grade) and public presentation of thesis (1/4 of final grade)	
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Article 4.3 Practical exercise

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
Internship Neurosciences I	AM_471108	27	4,5,6,3,2,1	Student writes research proposal, conducts neuroscientific experiments, analyses data, writes a report and presents and discusses the data in the research group (incl. formative assessment)	Research proposal 6 weeks after start internship final assessment consists of: attitude & execution (25%), oral presentation (25%), written report (50%; 25% assessor 1, 25% assessor2)	600
Internship Neurosciences II	AM_471109	25	4,5,6,3,2,1	Student writes research proposal, conducts neuroscientific experiments, analyses data, writes a report and presents and discusses the data in the research group (incl. formative assessment)	Research proposal 6 weeks after start internship final assessment consists of: attitude & execution (25%), oral presentation (25%), written report (50%; 25% assessor 1, 25% assessor2)	600

Article 4.4 Electives

1. The student can take four of the following electives:

- Advanced Clinical Neurosciences
- Advanced Human Neurophysiology
- Advanced Neurogenomics
- Complex Trait Genetics
- Developmental Neurobiology
- Functional Brain Imaging
- Genomic Data Analysis
- Live Cell Imaging
- Methods in Behavioral Neuroscience
- Neuro- and Psychopharmacology
- Neuroendocrinology
- Neuronal Networks In Vivo
- Psychophysiology
- Statistical Genetics for Gene Finding
- System Neurosciences

For course codes, credits etc.: See: article 4.2, optional courses year 2.

2. Students can compose their own set of electives, provided that they are in series. Students can choose the following series of four courses:
 - Course 1: Advanced neurogenomics OR Psychophysiology OR Advanced clinical neurosciences
 - Course 2: Live cell imaging OR Methods in behavioural neuroscience OR Statistical genetics for gene finding OR Functional brain imaging
 - Course 3: Developmental neurobiology OR Neuronal networks in vivo OR Complex trait genetics OR Neuroendocrinology
 - Course 4: Genomic data analysis OR Advanced human neurophysiology OR System neurosciences OR Neuro- and Psychopharmacology
3. If the student wishes to take a different course than the units of study listed, advance permission must be obtained in writing from the Examinations Board.

Article 4.5 Sequence of examinations

Students may participate in examinations for the units below only if they have passed the examination or examinations for the courses mentioned:

Advanced Neurogenomics after passing Neurogenomics

Article 4.6 Participation in practical exercise and tutorials

1. In the case of a practical exercise, the student must attend 100 % of the practical sessions. Should the student attend less than 100 %, the course examiner (course coordinator) will decide whether the student must take the practical at a later date, or whether the student has to do one or more supplementary assignments.
2. In the case of a work group with assignments, the student must attend 100 % of the work group sessions. Should the student attend less than 100 %, the course examiner (course coordinator) will decide whether the student must take the work group at a later date, or whether the student has to do one or more supplementary assignments..
3. In exceptional circumstances, the Examinations Board may, at the request of the student, permit an exemption from this requirement if, in the opinion of the Board, the assessment of the intended skills is also possible with a lesser percentage of participation, with or without the imposition of supplementary requirements.

Article 4.7 Maximum exemption

A maximum of 27 EC of the curriculum can be accumulated through granted exemptions.

Exemption can be granted for the courses

- writing a research proposal (3 ECTS), in case a course with similar objectives, and at least of equal workload (ECTS), was part of the BSc curriculum.
- In case a student was previously enrolled in the VU MSc Biomedical Sciences curriculum, but is now enrolled in MSc Neurosciences, exemption can be granted for the courses listed below, to a maximum of 24 ECTS:
 - Advanced Human Neurophysiology, AM_1003, 6 EC
 - Experimental and clinical neuroendocrinology, AM_470700, 6 EC
 - Functional Brain Imaging, AM_470715, 6 EC
 - Psychophysiology, AM_470736, 6 EC
 - Complex Trait Genetics, AM_470733, 6 EC
 - Genomic Data Analysis, AM_1008, 6 EC
 - Statistical Genetics for Gene Finding, AM_1040, 6 EC

Article 4.8 Validity period for results

As laid down in article 4.8 of OER part A.

Article 4.9 Degree

Students who have successfully completed their Master's final examination are awarded a Master of Science degree. The degree awarded is stated on the diploma.

5. Transitional and final provisions

Article 5.1 Amendments and periodic review

1. Any amendment to the Teaching and Examination Regulations will be adopted by the faculty board after taking advice from the relevant Board of Studies. A copy of the advice will be sent to the authorised representative advisory body.
2. An amendment to the Teaching and Examination Regulations requires the approval of the authorised representative advisory body if it concerns components not related to the subjects of Section 7.13, paragraph 2 sub a to g and v, as well as paragraph 4 of the WHW and the requirements for admission to the Master's program.
3. An amendment to the Teaching and Examination Regulations can only pertain to an academic year that is already in progress if this does not demonstrably damage the interests of students.

Article 5.2 Transitional provisions

Notwithstanding the current Teaching and Examination Regulations, the following transitional provisions apply for students who started the program under a previous set of Teaching and Examination Regulations:

1. Compulsory components that have been replaced

The compulsory components below have been replaced in academic year 2014-2015:

New component	Former component
AM_1123 Writing a Research Proposal (3 EC)	AM_471023 Scientific Writing in English (3 EC)

From 1 September 2014 students have to pass the new course unless they previously passed the old course.

The compulsory components below have been replaced in academic year 2011-2012:

New component	Former component
AM_1004 Molecule to Mind (12 EC)	470701 Principles of Neuroscience (6 EC) <i>en</i> 815054 Quantitative Methods in Neuroscience and Genetics (5 EC)

From 1 September 2011 students have to pass the new course unless they passed the old course.

2. Compulsory components that do not apply for students that started before 2012-2013

For students who started their program before academic year 2012-2013 the courses below are not compulsory:

- AM_1018 Neurophilosophy and Ethics (3 EC)

3. Elective components that have been removed from the curriculum

The courses below are no longer available in the program but are still elective components for students who started their program before academic year 2015-2016 and have passed the courses' examinations.

Courses ended in academic year 2014-2015

AM_471018 Neurobiology of Animal Behaviour

AM_1009 Synaptic and Cellular Neurophysiology

The courses below are no longer available in the program but are still elective components for students who started their program before academic year 2011-2012 and have passed the courses' examinations.

Courses ended in academic year 2010-2011:

- 470725 Bioinformatics (6 EC)
- 470735 Cognition and Attention (5 EC)
- 470711 Emotional and Cognitive Neuroscience (4 EC)
- 470714 Experimental Neurophysiology (6 EC)
- 470727 In Vivo Neurophysiology (6 EC)
- 470724 Neuroinformatics (6 EC)

4. Total of 120 EC

The final examination program should always total at least 120 EC.

Article 5.3 **Publication**

1. The faculty board will ensure the appropriate publication of these Regulations and any amendments to them.
2. The Teaching and Examination Regulations will be posted on the faculty website and deemed to be included in the course catalogue.

Article 5.4 **Effective date**

These Regulations enter into force with effect from 1 September 2015

Advice from Board of Studies, Neurosciences on 30 May 2015

Approved by authorised representative advisory body on 15 July 2015

Adopted by the faculty board/ VU: the faculty board on date 21 August 2015.