

# **Teaching and Examination Regulations**

## **Master's Degree Programme**

B. programme-specific section

### **M Neurosciences (60806)**

Academic year 2014-2015

## **Section B: Programme-specific section**

- 1. General provisions**
  - Article 1.1 Definitions
  - Article 1.2 Degree programme information
  - Article 1.3 Intake dates
  
- 2. Programme objectives and exit qualifications**
  - Article 2.1 Programme objective
  - Article 2.2 Exit qualifications
  
- 3. Further admission requirements**
  - Article 3.1 Admission requirements
  - Article 3.2 Pre-Master's programme
  - Article 3.3 Limited programme capacity
  - Article 3.4 Final deadline for registration
  - Article 3.5 English language requirement for English-language Master's programmes
  - Article 3.6 Free curriculum
  
- 4. Curriculum structure**
  - Article 4.1 Composition of programme
  - Article 4.2 Compulsory units of study
  - Article 4.3 Practical training
  - Article 4.4 Electives
  - Article 4.5 Sequence of examinations
  - Article 4.6 Participation in practical training and tutorials
  - Article 4.7 Maximum exemption
  - Article 4.8 Validity period for results
  - Article 4.9 Degree
  
- 5. Transitional and final provisions**
  - Article 5.1 Amendments and periodic review
  - Article 5.2 Transitional provisions
  - Article 5.3 Publication
  - Article 5.4 Effective date

## **Section B: Programme-specific section**

### **1. General provisions**

#### **Article 1.1 Definitions**

Not applicable

#### **Article 1.2 Degree programme information**

1. The programme Neurosciences CROHO number 60806 is offered on a full-time basis and the language of instruction is English.
2. The programme 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 programme 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 programme can be completed within the nominal study duration set for the programme.

### **2. Programme objectives and exit qualifications**

#### **Article 2.1 Programme objective**

The programme aims to educate students to neuroscientists able to conduct neuroscientific research independently. Students will acquire the necessary knowledge and skills, namely knowledge of, insight in and skills related to neurosciences, Academic skills including a critical disposition, insight in societal and ethical aspects of neuroscientific research.

#### **Article 2.2 Exit qualifications**

In all events, a graduate of the degree programme will have the following:

Master of Neurosciences graduates possess an academic attitude and academic skills. This means that Master's graduates are able to:

- independently acquire information on the field of neurosciences, and to analyse and critically evaluate this information;
- select and order information, to distinguish essentials from trivialities, and to make associations;
- think in multidisciplinary terms, and to possess an understanding of other disciplines (and sub-disciplines) that are important to their own specialism;
- independently and critically analyse research, both in relation to its design and performance, and to the results obtained;
- draw up a research plan, giving details of experimental design, performance and analysis;
- produce a written report and a verbal presentation of the research, in English;
- apply their knowledge of neuroscience to social questions;
- make an intrinsic contribution to scientific discussions relating to planned research or 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 place of the neurosciences within biology, the biomedical sciences, medicine and psychology;
- familiarity with the most relevant sources of information (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 and summarize neuroscience literature;
- set up and perform neuroscientific experiments;
- collaborate with researchers from other disciplines;
- familiarity with computer software that is relevant to the field.

### 3. Further admission requirements

#### Article 3.1 Admission requirements

1. Admission to the Master's programme 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 basic neurobiological principles
  - c) skills: well-developed academic skills including writing and presenting abilities, and the abilities 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 good grades:
  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. The master program can only be started after successful completion of a bachelor program.

#### Article 3.2 Pre-Master's programme

Not applicable

#### Article 3.3 Limited programme capacity

1. The faculty board will, if necessary, announce the maximum programme capacity by 1 May prior to the start of the academic year. The programme 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 the English 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 for admission to the first year of the Master's programme in Neurosciences, or rejection, 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 programme through Studielink before the dates that are determined in the Application and Registration Regulation (at <http://www.vu.nl/en/programmes/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's programmes

1. The proficiency requirement in English as the language of instruction can be met by the successful completion of one of the following examinations or an equivalent:
  - IELTS: 6.5
  - TOEFL paper based test: 580
  - TOEFL internet based test: 92-93
  - Cambridge Advanced English: A, B or C.
2. 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 programme:
  - 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 curriculum

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

## 4. Curriculum structure

#### Article 4.1 Composition of programme

1. The programme 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
    - Synaptic and cellular neurophysiology, or
    - Neurobiology of animal behaviour, or
    - Psychophysiology, or
    - Advanced clinical neuroscience.Followed by:
    - Live cell imaging, or
    - Methods in behavioral neuroscience, or
    - Complex trait genetics, or

Functional brain imaging  
 followed by:  
 Developmental neurobiology, or  
 Neuronal networks in vivo, or  
 Statistical genetics for gene finding, 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
<b>From Molecule to Mind</b>	<b>AM_1004</b>	12	1	lectures, computer labs, brain dissection lab rotation	Written progress exam: 10% of final grade. Written final exam: 90% of final grade	400
<b>Clinical neurosciences</b>	<b>AM_1005</b>	6	2	Lectures self-study	Written exam consisting of open-end questions	400
<b>Behavioral Genetics</b>	<b>AM_1006</b>	6	2	Lectures and computer practicals (	Written exam consisting of open-end questions (60%) + writing assignment (40%).	400
<b>Neurogenomics</b>	<b>AM_1007</b>	6	3	Lectures, student presentations, topical workshops, literature study	Written exam, presentations	500
<b>Writing a Research Proposal</b>	<b>AM_1123</b>	3	2	Writing excercises	class participation and all assignments.	400
<b>Internship Neurosciences I</b>	<b>AM_471108</b>	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

<b>Year 2: Neurophilosophy and Ethics</b>	<b>AM_1018</b>	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
<b>Year 2; Internship Neurosciences II</b>	<b>AM_471109</b>	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
<b>Year 2: Literature Survey Neurosciences</b>	<b>AM_471110</b>	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

## year 2

Name of course component	Course code	Number of credits	Period or semester	Teaching method	Type of test	Level
<b>Advanced neurogenomics</b>	<b>AM_470717</b>	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
<b>Synaptic and cellular neuro-physiology</b>	<b>AM_1009</b>	6	1	Lectures: 20 hrs Practicals: 28 hrs Mini project: 100 hrs	Theoretical exam 50% Mini project 25% Presentation 25%	500
<b>Neurobiology of animal behavior</b>	<b>AM_471018</b>	6	1	Lectures with discussion	Student presentation (15%) and written examination with open-ended questions	500

					(85%)	
<b>Psycho-physiology</b>	<b>AM_470736</b>	6	1	Lectures, practicals, self-study: 70h	Written examination (50% of grade) , independent performance (20%) presentation (30%).	500
<b>Advanced clinical neuroscience</b>	<b>AM_1014</b>	6	1	Lectures, writing a research proposal in small groups, rotation in the clinic, self study.	General attitude during the course (10%). Written Research proposal (50%). Oral Presentation of research proposal (40%).	600
<b>Live cell imaging</b>	<b>AM_470726</b>	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
<b>Methods in behavioral neuroscience</b>	<b>AM_470728</b>	6	1	Lectures/demonstrations with discussion	Student presentation (15%) and written examination with open-ended questions (85%)	500
<b>Complex trait genetics</b>	<b>AM_470733</b>	6	2	Combined lectures and work groups,	Written exam	500
<b>Functional brain imaging</b>	<b>AM_470715</b>	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.	General attitude during the course. Individual essay (50%). Team presentation (50%).	500
<b>Developmental neurobiology</b>	<b>AM_470713</b>	6	2	Lectures, seminars, master classes	Written mid-term exam (40%). Oral	500



				from experts in the field and hands-on training, student presentations	presentation of seminar task (30%). Oral presentation of lab work (30%). Students need to pass both parts (grade > 5.5) to obtain final grade.	
<b>Neuronal networks in vivo</b>	<b>AM_1001</b>	6	2	Plenary lectures, literature discussions, demonstrations and workshops.	Exam (40%), participation in discussions and workshops (20%), presentation (40%). All components have to be passed.	600
<b>Statistical genetics for gene finding</b>	<b>AM_470734</b>	6	1	Lectures, practical hands-on computer training.	Written exam	500
<b>Neuro-endocrinology</b>	<b>AM_470700</b>	6	2	Lectures, Outpatient clinics, Research tutorials	Written exam	500
<b>Genomic data analysis</b>	<b>AM_1008</b>	6	2	Lectures (20 hr), practicals (15 hr)	Written exam(60%), microarray data analysis assignment (20%), sequence analysis assignment (20%)	500
<b>Advanced human neurophysiology</b>	<b>AM_1003</b>	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

<b>System neurosciences</b>	<b>AM_470712</b>	6	2	Homework assignments, presentations, and tutored discussions (masterclass).	Evaluation of participation (33,3%); written proposal (33,3%), presentation of proposal (33,3%). To pass the course, the grade for each item should be 5.5 or higher.	500
<b>Neuro- and psycho-pharmacology</b>	<b>AM_470718</b>	6	2	Lectures, progression meeting with supervisor, writing a thesis and preparing presentation	Exam (1/4 of final grade), writing (1/2 of final grade) and public presentation of thesis (1/4 of final grade)	600

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
- Neurobiology of Animal Behaviour
- Neuroendocrinology
- Neuronal Networks In Vivo
- Psychophysiology
- Statistical Genetics for Gene Finding
- Synaptic and Cellular Neurophysiology
- 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. In practice, this means that the student can choose the following:

- Course 1: Advanced neurogenomics OR Synaptic and cellular neurophysiology OR Neurobiology of animal behaviour OR Psychophysiology OR Advanced clinical neurosciences
- Course 2: Live cell imaging OR Methods in behavioural neuroscience OR Complex trait genetics OR Functional brain imaging
- Course 3: Developmental neurobiology OR Neuronal networks in vivo OR Statistical genetics for gene finding 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 units 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 %, he/she must repeat the practical, or the examiner of the course may issue 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 %, he/she must repeat the work group, or the examiner of the course may issue 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 programme.
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 programme 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:

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

From 1 September 2014 students obtain the new course unless they passed the former .

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

<b>New component</b>	<b>Former component</b>
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 obtain the new course unless they passed the former .

**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 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 programme should always total 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 2014

Advice from Board of Studies, Neurosciences on 21 March 2014

Approved by authorised representative advisory body on 22 April 2014...

Adopted by the faculty board/ VU: the faculty board on date 19 September 2014