RESEARCH MASTER NEUROSCIENCES

FACULTY OF SCIENCE

VRIJE UNIVERSITEIT AMSTERDAM

QANU
Catharijnesingel 56
PO Box 8035
3503 RA Utrecht
The Netherlands

Phone: +31 (0) 30 230 3100
E-mail: support@qanu.nl
Internet: www.qanu.nl

Project number: Q0753

CONTENTS

This report was finalised on 8 April 2020.

REPORT ON THE MASTER'S PROGRAMME NEUROSCIENCES OF VRIJE UNIVERSITEIT AMSTERDAM

This report takes the NVAO's Assessment Framework for the Higher Education Accreditation System of the Netherlands for limited programme assessments as a starting point (September 2018). Since this report considers a research master's programme, the NVAO's Specification of additional criteria for research master's programmes (May 2016) are considered additionally as supplementary to this framework.

ADMINISTRATIVE DATA REGARDING THE PROGRAMME

Master's programme Neurosciences (research)

Name of the programme:	Neurosciences (research)
CROHO number:	60806
Level of the programme:	master's
Orientation of the programme:	academic
Number of credits:	120 EC
Specializations or tracks:	none
Collaboration:	◇ Philosophy of Neuroscience (FGW, VU University, double degree) ◇ Neurasmus (Erasmus Mundus funded programme, double degree)
Location(s):	Amsterdam
Mode(s) of study:	full time
Language of instruction:	English
Submission deadline NVAO:	01/05/2020

The visit of the assessment panel to the research master's programme Neurosciences of the Faculty of Science of Vrije Universiteit Amsterdam took place on the 18th of November 2019.

ADMINISTRATIVE DATA REGARDING THE INSTITUTION

Name of the institution:	Vrije Universiteit Amsterdam
Status of the institution:	publicly funded institution
Result institutional quality assurance assessment:	positive

COMPOSITION OF THE ASSESSMENT PANEL

The NVAO has approved the composition of the panel on the 14th of October 2019. The panel that assessed the master's programme Neurosciences at the Vrije Universiteit Amsterdam consisted of:

- Prof. dr. R.T. (Rudi) D'Hooge, professor Biological Psychology at KU Leuven (Belgium) [chair];
- Prof. dr. S.F. (Susan) te Pas, professor Cognitive Psychology at Utrecht University;
- Prof. dr. C. (Christian) Steinhäuser, professor and director of the Institute of Cellular Neurosciences at the University of Bonn (Germany);
- M. (Mesian) Tilmatine BSc, master's student Cognitive Neuroscience at Radboud University Nijmegen [student member].

The panel was supported by P. (Petra) van den Hoorn MSc and Mr. H. (Hester) Minnema, who acted as secretaries.

WORKING METHOD OF THE ASSESSMENT PANEL

The site visit to the master's programme Neurosciences at the Faculty of Sciences of Vrije Universiteit Amsterdam was part of the cluster assessment Cognitive Neurosciences. Between October and November 2019, the panel assessed four programmes at four universities. The following universities participated in this cluster assessment: Maastricht University, Vrije Universiteit Amsterdam, Erasmus University Rotterdam and Radboud University.

On behalf of the participating universities, quality assurance agency QANU was responsible for logistical support, panel guidance and the production of the reports. P. (Petra) van den Hoorn MSc was project coordinator for QANU and acted as secretary in the cluster assessment. Mr. H. (Hester) Minnema supported her as secretary during the site visits at Maastricht University and Vrije Universiteit Amsterdam. Both are certified NVAO secretaries.

Panel members
The members of the assessment panel were selected based on their expertise, availability and independence. The panel consisted of the following members:

- Prof. dr. R.T. (Rudi) D'Hooge, professor Biological Psychology at KU Leuven (Belgium) [chair];
- Prof. dr. S.F. (Susan) te Pas, professor Cognitive Psychology at Utrecht University;
- Prof. dr. T. (Tobias) Kalenscher, professor Comparative Psychology at Heinrich Heine Universität Düsseldorf (Germany);
- Prof. dr. E.A. (Eddy) van der Zee, professor Molecular Neurobiology at University of Groningen;
- Prof. dr. N.J.A. (Nic) van der Wee, professor Biological Psychiatry at Leiden University Medical Centre;
- Prof. dr. C. (Christian) Steinhäuser, professor and director of the Institute of Cellular Neurosciences at the University of Bonn (Germany);
- Prof. dr. R.A.H. (Roger) Adan, professor Molecular Pharmacology at Utrecht University;
- Prof. dr. C.M.A. (Cyriel) Pennartz, Hoogleraar Cognitive and Systems Neuroscience at the University of Amsterdam;
- Prof. dr. R. (Rufin) Vogels, professor Cognitive and Visual Neuroscience at KU Leuven (Belgium);
- Prof. dr. F.A.J. (Frans) Verstraten, professor and McCaughey Chair in Psychology at the University of Sydney (Australia);
- M. (Mesian) Tilmatine BSc, master's student Cognitive Neuroscience at Radboud University Nijmegen [student member];
- E. (Ekin) Tünçok BSc, master's student Cognitive and Clinical Neuroscience at Maastricht University [student-member].

Preparation
On 2 September 2019, the panel chair Prof. dr. R.T. (Rudi) D'Hooge was briefed by QANU on his role, the assessment framework, the working method, and the planning of site visits and reports. A preparatory panel meeting was organised on 14 October 2019. During this meeting, the panel members received instruction on the use of the assessment frameworks. The panel also discussed their working method and the planning of the site visits and reports.

The project coordinator composed a schedule for the site visit in consultation with the Faculty. Prior to the site visit, the Faculty selected representative partners for the various interviews. See Appendix 4 for the final schedule.

Before the site visit to Vrije Universiteit Amsterdam, QANU received the self-evaluation report of the programme and sent it to the panel. A thesis selection was made by the panel's chair and the project coordinator. Because students finish the programme with three capstones, it was decided that the panel should assess all three documents as a 'final project' per alumnus. The selection existed of 15

alumni and the assessment forms for all documents, based on a provided list of graduates between 30 September 2016 and 31 August 2018. A variety of topics and a diversity of examiners were included in the selection. The project coordinator and panel chair assured that the distribution of grades in the selection matched the distribution of grades of all available final projects.

After studying the self-evaluation report, final projects and assessment forms, the panel members formulated their preliminary findings. The secretary collected all initial questions and remarks and distributed these amongst all panel members.

Site visit
The site visit to Vrije Universiteit Amsterdam took place on Monday the 18th of November 2019. Before and during the site visit, the panel studied the additional documents provided by the programme. An overview of these materials can be found in Appendix 5.

At the start of the site visit, the panel discussed its initial findings on the self-evaluation report and the theses, as well as the division of tasks during the site visit.

The panel conducted interviews with representatives of the programme: students and staff members, the programme's management, alumni and representatives of the Examination Board. It also offered students and staff members an opportunity for confidential discussion during a consultation hour. No requests for private consultation were received.

The panel used the final part of the site visit to discuss its findings in an internal meeting. Afterwards, the panel chair publicly presented the panel's preliminary findings and general observations.

Consistency and calibration
In order to assure the consistency of assessment within the cluster, various measures were taken:

- The panel composition ensured regular attendance of (key) panel members, including the chair;
- The project coordinator was present during all site visits.

Report
After the site visit, the secretaries wrote a draft report based on the panel's findings. Subsequently, the report was sent to the panel. After processing the panel members' feedback, the project coordinator sent the draft report to the Faculty in order to have it checked for factual irregularities. The ensuing comments were discussed with the panel's chair and changes were implemented accordingly. The report was then finalised and sent to the Faculty and University Board.

Definition of judgements standards
In accordance with the NVAO's Assessment framework for limited programme assessments, the panel used the following definitions for the assessment of the standards:

Generic quality
The quality that, from an international perspective, may reasonably be expected from a higher education Associate Degree, Bachelor's or Master's programme.

Meets the standard
The programme meets the generic quality standard.

Partially meets the standard
The programme meets the generic quality standard to a significant extent, but improvements are required in order to fully meet the standard.

Does not meet the standard
The programme does not meet the generic quality standard.

The panel used the following definitions for the assessment of the programme as a whole:

Positive
The programme meets all the standards.

Conditionally positive
The programme meets standard 1 and partially meets a maximum of two standards, with the imposition of conditions being recommended by the panel.

Negative
In the following situations:
- The programme fails to meet one or more standards;
- The programme partially meets standard 1;
- The programme partially meets one or two standards, without the imposition of conditions being recommended by the panel;
- The programme partially meets three or more standards.

SUMMARY JUDGEMENT

Intended learning outcomes
The panel thinks that the chosen profile of the research master's programme Neurosciences (multidisciplinary, research-oriented, international and with emphasis on genetics and neurobiology and clinical and translational neurosciences) is very clear, contemporary and well-chosen. It prepares the students for research careers (inside or outside academia), is multidisciplinary, and keeps its ears and eyes open for the needs of society. The panel established that the intended learning outcomes are in line with the Dublin descriptors and with the Domain-Specific Reference Frame for master's programmes in Neurosciences. They are clearly formulated and meet the high standards that one can expect from a RMa programme. The panel encourages the programme to use the existing Amsterdam Neuroscience network to talk more explicitly about the content of its programme and/or to install an External Advisory Board to advise the programme on its relation to the labour market and its stakeholders in society.

Teaching-learning environment
The panel thinks that the curriculum and learning environment of the research master's programme Neurosciences are well-structured and highly coherent. The learning objectives for the various courses are related to each of the ILOs, and the programme prepares the students adequately for active and independent participation in research projects and the writing or co-authoring of scientific articles. The research context in which the RMa is being taught is excellent, with state-of-the-art neuroscience technologies and a great academic and intellectual environment. The students appreciate the ample opportunities for innovative ideas and their own initiatives. The faculty has access to state-of-the-art lab facilities of high quality. Teaching and assessment are done by professors and principal investigators of the CNCR and VUmc. The teaching staff are research scientists with good to excellent publication, citation, and grant acquisition records and international experience.

The programme strikes a delicate balance between basic knowledge on a vast number of topics and specialization, in particular in light of the very diverse pre-educational background of the group of students. The students experience a full research cycle hands-on and spend a substantial part of the programme on conducting research. The two trajectories are well-chosen and leave enough freedom for them to build their own programme. The programme load is certainly heavy, but given the level of commitment, qualifications and results of the student population, this seems very suitable for this type of programme. The panel recommends that the programme investigate possibilities to follow-up on the students' suggestion to improve the programme's first module.

The panel is positive about the plan to integrate the second internship and the literature survey into one project of 30 EC from the following academic year. It recommends searching for ways of including more programming and computational skills into the programme and considering acquainting students with ethical philosophical aspects of the neurosciences earlier in the programme and in more depth. The strong and explicit focus on future PhD positions – both in the selection procedure and in the programme – is appreciated by the panel, yet it advises the programme to pay more attention to alternative careers as well. Academic skills training forms part and parcel of the programme and is effectively incorporated in various courses and the internships. The panel supports the students in their request for paying more attention in the curriculum to communication with laymen.

The RMa programme has transparent and adequate procedures for the admission of students. The requirements are strict but well-chosen for a master's programme of this kind. The students are very well guided and monitored during their study, in a proper combination of their own initiative and responsibility on the one hand and easy access to teaching staff and the programme coordinator on the other. The newly designed Graduate Portfolio (3EC) will teach them even better to take responsibility for their own learning process and reflect on their career choices. The staff of the

programme is very committed and highly qualified. The majority is in the possession of a University Teaching Qualification.

Student assessment
The faculty has a sound assessment policy, and the panel ascertained that the assessment methods in the programme are sufficiently varied, suitable for the learning outcomes that they are meant to assess, and well thought out. The assessments clearly reflect the level of the programme. The panel read a random sample of theses and assessed that in most cases, it agreed with the final grades given by the reviewers. The forms used are transparent, but some examiners could give more detailed and specific feedback. There is still quite some variety in the way in which forms are filled in, which the panel thinks could be improved. The Examination Board and the Assessment Committee are proactive and successful in monitoring the quality of the assessments and have set up a coherent quality control cycle for this aim.

Achieved learning outcomes
The level of the final theses is more than adequate; most of them are of good to excellent quality. The theses show that the students achieve the intended learning outcomes and thus the research master's level.

The performance of alumni of the research master is impressive, with 93% finding a job within their own field and three-quarters of the graduates becoming researchers within academia. The programme maintains good and warm relations with its alumni.

The panel assesses the standards from the *Assessment framework for limited programme assessments* in the following way:

Master's programme Neurosciences

Standard 1: Intended learning outcomes	meets the standard
Standard 2: Teaching-learning environment	meets the standard
Standard 3: Student assessment	meets the standard
Standard 4: Achieved learning outcomes	meets the standard
General conclusion	positive

The chair, Prof. dr. R.T. (Rudi) D'Hooge, and the secretary, P. (Petra) Van Den Hoorn MSc, of the panel hereby declare that all panel members have studied this report and that they agree with the judgements laid down in the report. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Date: 8 April 2020.

DESCRIPTION OF THE STANDARDS FROM THE ASSESSMENT FRAMEWORK FOR LIMITED FRAMEWORK ASSESSMENTS

Organisational context
The Research Master (RMa) Neurosciences of Vrije Universiteit (VU), first launched in 2002, is a joint initiative by the Faculty of Earth and Life Sciences (FALW), the Faculty of Psychology and Education (FPP) and the VU University Medical Center (VUmc). It is organized in the Centre for Neurogenomics and Cognitive Research (CNCR) of the Faculty of Science. CNCR is also one of the research centres at the Amsterdam-wide Neuroscience Campus (referred to as Amsterdam Neuroscience), which combines a wide range of neuroscience centres including the Amsterdam UMC, locations AMC and VUmc, the Swammerdam Institute for Life Sciences (SILS) at the Science Park Amsterdam, and The Netherlands Institute for Neuroscience of the KNAW. At present, over 500 students have successfully completed the programme. The RMa is also embedded in the Neurasmus European Neuroscience Master programme funded by the EU Erasmus Mundus programme, which prepares students for a double or multiple degree in Neurosciences. Neurasmus is a partnership between VU Amsterdam, Bordeaux Neurocampus, European Neuroscience Institute Göttingen-CNMPB, Charité – Universitätsmedizin Berlin, and Université Laval, Québec, Canada. The programme also collaborates with the Faculty of Humanities of VU in the double-degree programme Philosophy of Neuroscience.

Standard 1: Intended learning outcomes
The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Findings

Profile
The RMa programme Neurosciences aims to train students to become neuroscience researchers who are capable of independently performing neuroscientific research that addresses questions of how the healthy brain works, what causes brain disorders, and how brain disorders can be treated. Graduates have learned how to address these questions at multiple levels, from the molecular level to the behavioural and societal level. The research master's programme offers a combination of a strong focus on neurogenetics, neurogenomics, biochemistry, cell biology, and neurophysiology on the one hand, and behavioural, systems and clinical neurosciences on the other. The programme and the participation of three faculties ensure that there is a tight interaction between fundamental and applied clinical neuroscience research at multiple levels.

The programme provides students with extensive training in experimental research aimed at analysing molecular and cellular mechanisms underlying brain function and understanding brain (dys)function on the level of circuitry, plus the intact brain's function and behaviour. According to the Self-Evaluation Report (SER), the programme has a particular focus on behavioural genetics, neuropharmacology and brain disease. The panel assessed that the programme has a very strong and research-oriented profile with an emphasis on genetics and neurobiology. The programme continuously tries to be relevant to contemporary neuroscience, while keeping the broader context in mind (e.g. issues in other disciplines, general needs in society). Its profile pays ample attention to the multidisciplinary functioning of its students in an international environment and to social and ethical aspects.

Intended Learning Outcomes (ILOs)
The panel found that the ILOs are clearly formulated and explicitly aimed at educating students to become researchers, in or outside academia. The ILOs offer a very solid preparation for a research career by paying ample attention to research skills, processing and analysing data, research ethics, and skills learned in a self-directed and autonomous manner.

The programme defined 17 exit qualifications divided into five categories following the Dublin descriptors: knowledge and understanding; applying knowledge and understanding; making judgements; learning focus; and communication. They adequately represent the high standards suitable for a research master's programme. The learning outcomes are also aligned to the Domain-Specific Reference Frame for master's programmes in Neurosciences. According to the panel, they emphasize the programme's aim to train students to become more independent researchers compared to a regular master's programme, which suits an RMa.

The SER states that the programme collects active input from the city-wide Amsterdam Neuroscience organization to guarantee that the goals of the programme meet the expectations and requirements of the professional field. The panel encourages the programme to formalise the programme's efforts to continuously keep up with the rapid developments in the surrounding world, e.g. by installing an External Advisory Board or by using the Amsterdam Neuroscience network more explicitly to talk about the content of the master's programme with several parties.

Considerations
The panel thinks that the chosen profile of the research master's programme Neurosciences (multidisciplinary, research-oriented, international and with emphasis on genetics and neurobiology and clinical and translational neurosciences) is very clear, contemporary and well-chosen. It prepares the students for research careers (inside or outside academia), is multidisciplinary, and keeps its ears and eyes open for the needs of society. The panel established that the intended learning outcomes are in line with the Dublin descriptors and with the Domain-Specific Reference Frame for master's programmes in Neurosciences. They are clearly formulated and meet the high standards that one can expect from a RMa programme. The panel encourages the programme to use the existing Amsterdam Neuroscience network to talk more explicitly about the content of its programme and/or to install an External Advisory Board to advise the programme on its relation to the labour market and its stakeholders in society.

Conclusion
Master's programme Neurosciences: the panel assesses Standard 1 as 'meets the standard'.

Standard 2: Teaching-learning environment
The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Findings
The panel studied the content, structure, and teaching-learning environment of the programme by reading the SER, studying the course descriptions, and meeting with the management, teachers, students and alumni.

Structure of the programme and connection to intended learning outcomes
The research master's programme Neurosciences takes two years and has a total study load of 120 EC. Throughout the program, several learning trajectories (on neuroscientific knowledge, research skills, academic skills and reading primary research articles) are embedded in the courses. These trajectories are monitored by the programme coordinator through the assessment plan to ensure that all the intended learning outcomes are sufficiently covered during the programme.

The first semester of the first year consists of a set of obligatory courses on current concepts and topics in modern fundamental, translational, and clinical neuroscience research. These first eight weeks are designed to ensure that all incoming students with different educational backgrounds obtain the same level of knowledge. Therefore, the start of the programme is tough for both students and teachers but, as the panel assessed, also much appreciated by the students and alumni. Being immersed in the breadth of neuroscientific topics and confronted with the inspiring interaction with students with other knowledge backgrounds right at the beginning presents a very steep learning

curve for the new students. At the same time, it creates a strong sense of community, as the students and teachers told the panel. Nevertheless, the students stated in the SER that the course workload of the first module (Molecule to Mind) is heavy and that there is not enough time to master everything. During the site visit, the students, teachers and programme management discussed a number of suggestions on how the first module could be improved (extend its duration, refine the introductory materials, or design a premaster course for students who lack a biomedical background). The panel recommends that the programme discuss these suggestions with the students and investigate their feasibility.

During the second semester of year 1, the students do their first research internship. During that same period, the Academic Writing for Neurosciences course is obligatory, in which they write a research proposal for their internship topic. During the internship, the students apply the knowledge obtained during the courses in the first semester and deepen their practical research skills. Typically, their first internship is based at one of the research groups within the CNCR or VUmc. The internship is completed by writing a final report based on the research done during the internship (a total of 27 EC).

In the first semester of the second year, the students take four sequential elective courses, during which they specialize in a particular field of neuroscience, get hands-on experience with more neuroscience lab research methods, and refine their research presentation skills. The elective courses are organized into two trajectories: Fundamental Neurosciences and Clinical and Translational Neurosciences. The panel learned that the trajectories should not be treated as full-blown tracks: they are meant to help the students choose a coherent set of specializing courses, but they are free to mix courses from the two trajectories, providing them with the opportunity to create their own focus of interest. The Fundamental Neurosciences trajectory features eight courses, ranging from Live Cell Imaging to Methods in Behavioural Neurosciences and Systems Neuroscience. Clinical and Translational Neurosciences features five courses, including Functional Brain Imaging, Neuro- and psychopharmacology and Rhythms of the Brain.

In period 3 of the second year, all of the students take the obligatory course in Neurophilosophy and Ethics, during which they further develop their critical thinking skills and learn more about the societal and ethical aspects of neuroscience research. The panel endorses the importance of this course but thinks that it comes rather late in the programme. In addition, the student chapter of the SER states that the students believe the course is too short (2 weeks) for in-depth discussions. The panel advises the programme, therefore, to consider possibilities to acquaint students earlier in the programme and more in-depth with these issues – e.g. by letting them write an ethics proposal – so that they can implement the acquired knowledge and understanding already during their first internship.

In the second semester of the second year, scientific and research skills are further developed by writing a literature survey (8 EC) and doing a second research internship, again finalized by a thesis (together 25 EC). The new 3 EC Graduate's Portfolio, starting in the second semester of the first year and continuing throughout the programme, helps students reflect on their own skills and take the initiative to improve themselves (see also below under *job market orientation)*.

The panel found that the programme has succeeded well in translating the ILOs into a well-structured and coherent curriculum. It ascertained that each ILO is related to at least one of the learning objectives for the various courses and is convinced that the students are very well prepared to participate actively and independently in research projects and to write or co-author scientific articles. It applauds the programme – in particular in light of the very diverse pre-educational background of the group of students – for the delicate balance it strikes between basic knowledge on a vast number of topics and specializations. It is positive about the reduced number of trajectories in the second year – since the previous accreditation they have been reduced from six to two – and thinks the remaining two trajectories are well-chosen and leave enough freedom for students to build their own programme. It endorses the plan to integrate the second internship and the Literature Survey into one project of 30 EC from the next academic year. An internship of 30 EC, of which the

literature survey will be an integral part, is expected to give students more focus and depth in the topics they deal with, thus hopefully reducing study delays.

The student chapter of the SER and student surveys indicated that several students think that programming and computational knowledge should be integrated into more courses of the programme. Presently, this gap is mainly filled by the extra-curricular Pizza4Python meetings, organized by students to help each other in acquiring more computer and programming skills. During the visit, the panel discussed this issue with the programme management, teachers and students and established that there seems to be agreement that for a substantial number of students, more could and should be done in this respect to be properly prepared for their research internships. Nevertheless, there are several dilemmas – e.g. how to bring students with no computer background to a sufficient level during the already heavy RMa programme – to which the programme has not yet found answers. The panel applauds the Pizza4Python sessions but is worried that their heavy dependence on the initiative of incoming and outgoing students can endanger their continuity. It acknowledges the complexity of this issue, but encourages the programme to actively seek solutions and not fall behind in this – rapidly growing – aspect of its field of research.

Capstones
Capstones of the programme by which students prove that they have achieved the intended learning outcomes are three theses: two written reports on the research done during the internships (in the form of a scientific article and an oral presentation) and a literature survey. The panel assessed that this allows the students to experience a full research cycle hands-on. In principle, the theses aim at contributing to actual scientific publications with the student as co-author. According to the panel, the theses are of an appropriate size: the students spend a substantial part of the programme (60 EC) on conducting independent research and proving that they have achieved all the intended learning outcomes. Nevertheless, the second internship is rather short in its opinion. The proposed integration with the literature survey redresses this to a certain extent, but it recommends creating ways to enlarge the second internship even more. A larger internship could allow for more immersion and a publishable research output. For example, this is possible when the first internship is shortened or transformed into a shorter period of laboratory rotations.

It is the students' responsibility to find an adequate internship. The programme coordinator and junior lecturer support them in their search for an internship and a VU supervisor. For each internship, the student has to find a VU supervisor and a day-to-day supervisor, to ensure adequate supervision. In case of an external placement, an on-site supervisor is appointed as well. If the student carries out his/her internship internally (at the VU), the VU supervisor acts as on-site supervisor simultaneously. Both the VU supervisor and the on-site supervisor must have a PhD degree, a position in higher education or research, and be a member of staff from the institute offering the internship. Day-to-day supervision may also be carried out by a PhD student, postdoc or temporary researcher working under the supervision of the VU supervisor / on-site supervisor. The latter will retain overall responsibility.

Before a student can start an internship (first or second), the programme coordinator scrutinizes whether the internship project (including the research proposal) is in accordance with the internship guidelines. These guidelines state a list of specific requirements for the internship and the research proposal before the internship plan can be approved (e.g. the internship is related to the field of neurosciences, provides the student opportunities to conduct supervised research independently). Regarding the research to be carried out by the student during the internship, the research plan needs to be of the right level and size. After approval, the student gives an oral presentation of the research proposal to the supervisor's research group. The supervisor has to approve the proposal before the internship can start.

During the internship, the student is trained to independently perform neuroscientific research by experiencing the entire research cycle, from formulating research questions, designing hypotheses and doing the experiments to testing them, evaluating the results and discussing them in the context

of the literature, leading to further research questions. The topic, research questions and tools used in the first and second internships need to be substantially distinct. The students are encouraged to do the second internship in a lab outside the VU/VUmc or abroad.

The Placement Manual for Internships in the MSc Neurosciences programme clearly describes the requirements of the research internships, deadlines for the students, and procedures and quality checks to monitor the content, progress and guidance given during the internship. The panel is assured that the criteria, procedures and quality control of the internships and capstones are well in place and adequately communicated to the students.

Job market orientation
The SER states that the programme took to heart the appeal by senior students and staff to pay more attention to career preparation and mentorship in the programme. The newly developed Graduate's Portfolio (3 EC) is meant to give students guidance in reflecting on their academic development and professional choices throughout the programme. The panel applauds this initiative, which teaches students to take responsibility for their own learning process and reflect on the career choices they have to make. It is not convinced, however, that this sufficiently redresses the issue of preparation for careers outside PhD trajectories. Because of the limited number of PhD positions and for reasons of personal ambition, not all students end up in a PhD programme, and of those who do, not all continue in academia upon receiving their doctorate. The panel, therefore, advises the programme to make students more aware that the knowledge and skills they acquire during this prominent master's programme can be extremely valuable in other professions as well, e.g. by bringing them more in touch with companies or public organisations.

Academic skills
The training of academic skills is mostly embedded throughout the programme and designed to provide training, amongst other things, in analysing and discussing the primary literature, neuro-philosophy and ethics, and academic writing and presenting research proposals and outcomes to colleagues and the larger public. Academic writing is also taught in a separate course (3 EC) parallel to the first internship. The programme provides students with hands-on training in neuroscience research, and their active participation is a major focus. They are exposed in different courses and during their internships to different research approaches in fundamental, theoretical, experimental, translational and clinical settings. They learn about the strengths and limitations of these approaches and how to communicate with researchers from different disciplines and form bridges in multidisciplinary teams. They give multiple presentations during these internships about research articles, research proposals, and outcomes of experiments they conducted. In addition, they present results in poster presentations and written research reports about internship projects throughout the programme to their peers and lecturers.

The panel assessed that academic skills training forms part and parcel of the programme and is incorporated in various courses and the internships. The students have asked for more attention in the curriculum to communication with laymen, a request supported by the panel.

Selection and admission requirements
Around 40 to 50 students each year from all over the world are selected to enrol in the programme, thereby creating an international classroom. The general requirement for admission is a university bachelor degree related to neurosciences with a grade point average (GPA) of 7.5 according to the Dutch grading system. Successful applicants must also have strong English language proficiency (TOEFL: 92; IELTS: 6.5; Cambridge English Scale CES: CAE A or B) and a strong interest in neuroscience and in pursuing a research career by obtaining a PhD. Their bachelor thesis has to be graded 8 or above, and they are asked to send in a piece of academic writing such as an internship report or thesis and two reference letters from qualified persons.

According to the panel, the selection and admission requirements are well chosen for a programme with a strong emphasis on research. The procedures for admission are transparent and adequate.

Between 2013 and 2019, the proportion of international students in this period ranged from 30% to 40%. The educational background of the master's students is heterogeneous, ranging from medicine and biotechnology to physics and artificial intelligence to psychology and liberal arts and sciences. Occasionally, talented students with an HBO (vocational) bachelor diploma are admitted to the program. The panel favours this very much, since it finds it important that master's programmes are also accessible to talented and ambitious students whose educational career did not follow the usual path.

Teaching methods and student-centred learning
The programme uses activating teaching methods according to the principle of Constructive Alignment, which engages active participation in the learning process. This is realized predominantly by interactive teaching in small classes and by project and problem-driven education. Additionally, the students familiarize themselves with the process of doing research throughout all courses, by article reading and discussion, site visits and demonstrations, frequent presentations of research proposals or internship progress, doing lab rotations and research and computer practicals. This ensures that acquiring content knowledge and research skills is closely interwoven.

Early in the programme, the students are exposed to current neuroscience research on campus, so that they can orient themselves towards their first research internship. They are also informed early on about the trajectories and elective courses in year 2 and provided with enough freedom to build their own programme. They are challenged to take the lead in shaping their own learning trajectories and deepen their understanding and expertise on the topics they are most interested in, which the panel considers a strength of the programme.

The panel assessed that the teaching methods are varied, encourage active participation, help the students increase their self-confidence, and meet contemporary pedagogical standards.

Study progression, guidance and feasibility
Some 70% of the students graduate in two years; the rest needs more time. The programme load is certainly heavy, but given the level of commitment and qualifications of the student population, this seems very suitable for this type of programme. During its visit, the panel discussed the reasons for this high proportion of delays. It was told that there are various reasons, including the fact that the students underestimate the literature survey. By combining the survey with the second internship (starting in the academic year 2020-2021) and by imposing a strict deadline for the delivery of the internship reports (four weeks after the agreed end date of the internship), the programme hopes to diminish the delay.

Another reason is that some students are doing a double degree or decide to stay in the internship longer than needed, as a volunteer hoping to get a position. The panel assessed that the delay was often unrelated to the content of the programme. Generally speaking, any delay should not be harmful for the students' future opportunities. On the contrary, in many cases the delay is caused by the students' calculated strategies to increase their job opportunities.

The panel thinks that the students are very well guided and monitored during their study, with a clear emphasis on their own initiative and responsibility. It applauds the programme for striking a proper balance between encouraging their independence and the availability of guidance where needed. The programme coordinator is the first point of contact for the students for planning and potential issues with study progress and plays an important role in effectively providing them with information and support. For issues of a more personal nature, the students can also visit the Faculty Student Advisor. A junior lecturer was appointed recently to the programme to increase academic and internship support. As mentioned earlier, the Graduate's portfolio course (3EC) was introduced to offer the students opportunities and support to tailor and self-reflect on their professional development.

Language and programme name
The choice to make the RMa an English-spoken programme is directly derived from its intended learning outcomes that expect graduates to be able to communicate their research in English (ILO 7), from the international context of research in the field of Neurosciences, and from the international student population. For the panel, the choice for English as the language of instruction is self-evident since all research in the field of neuroscience is performed in English, and the main aim of the programme is to prepare students for a research career. Only an English-spoken research master's programme can keep up with the high international standards and attract the best students and top researchers from all over the world.

Teaching staff
During the site visit, the panel met a very committed and highly qualified staff. The students spoke very positively about their teachers and praised their very active involvement with their students. They told the panel that the programme provides a lot of opportunities to come up with innovative ideas and own initiatives for research. They are encouraged to go off the beaten track. Good ideas proposed by students are taken seriously and supported by the staff, e.g. the annual study trip that started as a student initiative and has now become part of the programme. The staff enjoys very much working with this group of highly motivated students, whom they view as their future colleagues.

To teach at VU Amsterdam, staff members with a permanent position are required to follow a Certificate Programme in Learning and Teaching in Higher Education (LTHEP) and obtain the University Teaching Qualification (UTQ/BKO). Teachers can only be promoted from salary scale 10 to 11 after obtaining the UTQ and can only be promoted from scale 12 to 13 after obtaining the additional senior teacher qualification (STQ). Furthermore, to teach in the English-spoken RMa programme, the staff has to have an advanced command of the English language and is required to have a score of minimally C1 at the European Reference Frame (EF SET score 61 or above). The panel appreciates this clear and strict policy.

Most teachers have obtained the UTQ and have done a language test for English proficiency, which the panel appreciates. Those teachers who did not obtain these certificates usually had a good reason (e.g. short contracts, in the process of obtaining the certificate, or English is their native language). The panel was surprised to learn from the documents provided that one fulltime professor and one fulltime lecturer (UD) do not have a UTQ certificate nor are they in the process of obtaining it. It also noted that most of those without a UTQ are course coordinators. It recommends redressing these gaps. As far as the level of English proficiency is concerned, it does not doubt that in this highly international domain, language standards will surely be met. For the sake of transparency, however, it would be wise to create a formal procedure for when to grant waivers for those teachers with clearly proven proficiency.

Teaching and assessment are done by professors and principal investigators of the CNCR and VUmc. The panel ascertained that the teaching staff are first and foremost research scientists with good to excellent publication, citation, and grant acquisition records and international experience. These neuroscientists offer their laboratories to teach the students hands-on skills to perform the latest techniques in neuroscience research. PhD students and post-docs from the groups of the teaching staff supervise these practicals, which creates a close interaction with early-career scientists for the students.

Context of research
The panel established that the research context in which the RMa is being taught is excellent, with state-of-the-art neuroscience technologies and a great academic and intellectual environment. The faculty has access to many state-of-the-art lab facilities of high quality. The Centre for Neurogenomics and Cognitive Research (CNCR) hosts the programme. This is a multidisciplinary neuroscience research centre, in which 150 researchers collaborate to elucidate how basic molecular and cellular processes shape the emergent complexity of the brain. The centre has an outstanding

research productivity, both in terms of third-party funding success as well as publication output. Its senior researchers and professors are closely involved in the educational programme and the training of PhD students. Principal investigators at the CNCR are excellent, as exemplified by 5 ERC grants, 5 NWO VICI grants and the recently awarded NWO Gravitation 2019 grant of €20 million led by CNCR.

Principal investigators from various departments at VUmc also teach in the programme. Clinical and translational research at the VUmc is organised in world-renowned research centres in which many of these departments collaborate. Examples of such interdisciplinary collaborations are the Alzheimer Centre, the Multiple Sclerosis (MS) centre, and the VUmc Imaging Centre. Researchers from other Neuroscience institutes in the Amsterdam area – organised as Amsterdam Neuroscience – participate in the programme by providing internship and research training positions to the RMa students.

Considerations

The panel thinks that the curriculum and learning environment of the research master's programme Neurosciences are well-structured and highly coherent. The learning objectives for the various courses are related to each of the ILOs, and the programme prepares the students adequately for active and independent participation in research projects and the writing or co-authoring of scientific articles. The research context in which the RMa is being taught is excellent, with state-of-the-art neuroscience technologies and a great academic and intellectual environment. The students appreciate the ample opportunities for innovative ideas and their own initiatives. The faculty has access to state-of-the-art lab facilities of high quality. Teaching and assessment are done by professors and principal investigators of the CNCR and VUmc. The teaching staff are research scientists with good to excellent publication, citation, and grant acquisition records and international experience.

The programme strikes a delicate balance between basic knowledge on a vast number of topics and specialization, in particular in light of the very diverse pre-educational background of the group of students. The students experience a full research cycle hands-on and spend a substantial part of the programme on conducting research. The two trajectories are well-chosen and leave enough freedom for them to build their own programme. The programme load is certainly heavy, but given the level of commitment, qualifications and results of the student population, this seems very suitable for this type of programme. The panel recommends that the programme investigate possibilities to follow-up on the students' suggestion to improve the programme's first module.

The panel is positive about the plan to integrate the second internship and the literature survey into one project of 30 EC from the following academic year. It recommends searching for ways of including more programming and computational skills into the programme and considering acquainting students with ethical philosophical aspects of the neurosciences earlier in the programme and in more depth. The strong and explicit focus on future PhD positions – both in the selection procedure and in the programme – is appreciated by the panel, yet it advises the programme to pay more attention to alternative careers as well. Academic skills training forms part and parcel of the programme and is effectively incorporated in various courses and the internships. The panel supports the students in their request for paying more attention in the curriculum to communication with laymen.

The RMa programme has transparent and adequate procedures for the admission of students. The requirements are strict but well-chosen for a master's programme of this kind. The students are very well guided and monitored during their study, in a proper combination of their own initiative and responsibility on the one hand and easy access to teaching staff and the programme coordinator on the other. The newly designed Graduate Portfolio (3EC) will teach them even better to take responsibility for their own learning process and reflect on their career choices. The staff of the programme is very committed and highly qualified. The majority is in the possession of a University Teaching Qualification.

Conclusion
Master's programme Neurosciences: the panel assesses Standard 2 as 'meets the standard'.

Standard 3: Student assessment
The programme has an adequate system of student assessment in place.

Findings

Assessment and assessment system
Assessment at the RMa programme follows a faculty-wide perspective on the quality control of student assessments. In line with this policy, the master's programme Neurosciences has developed an Assessment Plan – updated yearly – which describes the view on education in relation to assessment, the alignment of the modes of assessment with the attainment of learning outcomes, the type of assessment used in each of the courses, the monitoring of the quality of assessment and an evaluation of the past year. Each course has an assessment matrix (toetsmatrijs) in which its learning goals are specified, their relation to the learning outcome of the program, as well as the mode of assessment for each goal.

The panel established that the faculty has a sound assessment policy (for instance, specifying the principle of constructive alignment, the four-eyes principle, and quality criteria for the programme's staff). The programme's assessment methods are sufficiently varied, suitable for the learning outcomes that they are meant to assess and well thought out. Its assessment plan shows that every ILO is represented in a number of courses. Aside from formative feedback given during each course, the modes of summative assessment are academic writing (essay, research proposal, report); oral presentation (poster/powerpoint); practical performance; and written exam (open-ended questions). The assessments clearly reflect the level of the programme. Group assessment is part of the curriculum – because collaboration with other researchers is an important learning outcome of the programme – but all courses must have at least one individual assessment.

Assessment of internship report and literature survey (capstones)
The Placement Manual for Internships in the MSc Neurosciences programme provides instructions and rubrics for assessors for judging the quality of research reports and surveys. Supervision, examination and quality control in the research projects and literature surveys are carried out by at least two qualified assessors (appointed by the Examination Board). The VU supervisor reads and grades the experimental work, attitude, final research report or literature survey, and oral presentation. S/he can consult the on-site supervisor and/or day-to-day supervisor for input on the assessment of the student's work and attitude during the internship. S/he is a permanent member of staff at VU or VUmc, holds a PhD degree, and has been appointed as an examiner by the Examination Board. An independent second assessor independently grades the final written report or literature survey. In general, there are no more than two draft rounds before the final report is handed in.

The panel agrees with the assessment procedure of the programme's capstones. As a small piece of advice, however, the programme might consider giving the oral presentation more weight in the total assessment procedure. Currently, the student usually presents his/her work to the research group in which the internship was carried out, after which the VU supervisor gives a grade. The panel thinks the oral presentation could more strongly have the character of a defence (e.g., a public defence procedure, involving also the assessment of the second assessor).

A third assessor will be appointed by the Examination Board when the difference between the mark of the VU supervisor and the second assessor is equal to or more than 2 (on a scale 1-10) or if one of the assessors judges the report as insufficient. The Placement Manual describes in detail how the grades of the two (or three) examiners are processed to reach a final grade.

The panel read a representative sample of capstone documents and assessed that in most cases, it agreed with the final grades given by the reviewers. The forms used are well-designed and transparent. However, there is still quite some variety in the way in which the forms are filled out, which the panel thinks could be improved. For example, some examiners could give more detailed and specific feedback. When the students are provided with more feedback, they can make more progress during their study.

Examination Board and Assessment Committee
A Faculty-wide Examination Board oversees and controls the quality of all educational programmes within the Faculty, both bachelor's and master's programmes. In this Examination Board, the RMa programme has its own sub-committee that is dedicated to the Neurosciences.

To monitor the quality of assessment within individual courses, the Examination Board receives annual assessment reports (toetsdossier) which consist of: the exam; the response model (antwoordmodel); the assessment matrix (toetsmatrijs); student scores; and an assessment report. The Examination Board actively approaches course coordinators to share these documents, which resulted in at least 95% coverage of individual components across courses. The assessment reports are individually evaluated by the Examination Board and recommendations communicated to the course coordinator where relevant. In addition, a subset of literature surveys and internship reports are crosschecked by the Examination Board to confirm the validity of the assessment outcome. The Examination Board appoints qualified assessors and interacts with the Assessment Committee (toetscommissie) on independent course evaluations. Since 2016, eight courses have been evaluated, which resulted in a detailed feedback report with recommendations. A recent example of a course in which assessment procedures were subsequently improved is the second-year course Experimental and Clinical Neuroendocrinology.

The panel is impressed by how the Examination Board, together with the Assessment Committee, has implemented a full quality control cycle for the student assessments in the programme and encourages them to continue in the same manner.

Considerations
The faculty has a sound assessment policy, and the panel ascertained that the assessment methods in the programme are sufficiently varied, suitable for the learning outcomes that they are meant to assess, and well thought out. The assessments clearly reflect the level of the programme. The panel read a random sample of theses and assessed that in most cases, it agreed with the final grades given by the reviewers. The forms used are transparent, but some examiners could give more detailed and specific feedback. There is still quite some variety in the way in which forms are filled in, which the panel thinks could be improved. The Examination Board and the Assessment Committee are proactive and successful in monitoring the quality of the assessments and have set up a coherent quality control cycle for this aim.

Conclusion
Master's programme Neurosciences: the panel assesses Standard 3 as 'meets the standard'.

Standard 4: Achieved learning outcomes
The programme demonstrates that the intended learning outcomes are achieved.

Findings

Final project and thesis quality
The panel thinks that the total size (60 EC) of the final project (two internship reports and a literature survey) is large enough to have gone through a full research cycle and to assess whether students have achieved all the intended learning outcomes. However, as mentioned under standard 2, it recommends that the programme reconsider ways to increase the second internship, for instance by integrating it with the literature survey as planned.

The panel read a representative sample of 15 final projects (the complete set of documents (two reports and the literature survey) per graduate). It was generally pleased with their high quality. Most of them were of good to excellent quality. Their research topics fell well within the scope of the programme and ambitions of this research master. They were well-structured and well-written and presented relevant discussions on sometimes complex topics. Their theoretical framework was mostly strong and in-depth, and the panel was pleased to learn that, according to the SER, about two-thirds of the graduates co-authored published articles from their master's thesis work. The grades given discriminate appropriately between the theses. The lower graded works – compared to the others – had some flaws in different issues, e.g. writing styles, depth, or concerning methodology.

Alumni success
The performance of the research master's alumni seems very positive. During the meeting with some of them – all of them working in an academic environment – they told the panel that they felt very well prepared for the research jobs they presently fulfil and that they frequently apply the skills and knowledge learned in the programme. Of the 2010-2016 cohorts, 93% found a job or are enrolled in other programmes. Around three-quarters of these graduates became a researcher within academia (63% of the graduates continue in a PhD position). When including research jobs outside academia, the figure is 88%. The remaining graduates work in a variety of sectors, including health care, government, education, pharmaceutical industry or IT. The panel is impressed by these results and thinks that they fit with the programme's goals to educate researchers. The programme maintains good and warm relations with its alumni and supports initiatives to let the students interact with alumni (for example, via career days).

Considerations
The level of the final theses is more than adequate; most of them are of good to excellent quality. The theses show that the students achieve the intended learning outcomes and thus the research master's level.

The performance of alumni of the research master is impressive, with 93% finding a job within their own field and three-quarters of the graduates becoming researchers within academia. The programme maintains good and warm relations with its alumni.

Conclusion
Master's programme Neurosciences: the panel assesses Standard 4 as 'meets the standard'.

GENERAL CONCLUSION

The panel assessed standards 1, 2, 3, and 4 as 'meets the standard'. Based on the NVAO decision rules regarding limited programme assessments, the panel therefore assesses the programme as 'positive'.

Conclusion
The panel assesses the *master's programme Neurosciences* as 'positive'.

APPENDICES

APPENDIX 1: DOMAIN-SPECIFIC FRAMEWORK OF REFERENCE

Domain specific reference frame for master's level educational programmes in the Neurosciences[1] and intended learning outcomes

At the master's level, the field of Neurosciences in the Netherlands focuses on a multidisciplinary approach of research questions pertaining to the workings of the brain in health and disease. The field ranges from research at the interface between genetic, molecular and cellular processes to computational, system-level neuroscience with cognitive and behavioural analyses. The Neurosciences investigate all aspects of the brain, the nervous system and the senses: anatomy, physiology, biochemistry, genetics, cell biology, and molecular biology, and also investigate the interrelations between these aspects, as well as how these give rise to, e.g., perceptions, cognition, emotions and movement.

The Neurosciences address three main questions:

1. How does the brain work, and how does it give rise to, for instance, cognition, perception, emotions, learning, memory, consciousness and behaviour?
2. What goes wrong in brain diseases, and how does this affect, for instance, cognition, perception, emotions, learning, memory, consciousness and behaviour?
3. How can we influence the brain, and cure brain diseases or treat their symptoms?

In research to answer these questions, the brain is not viewed as an isolated organ; rather, the brain continuously interacts with the body and its environment, throughout an individual's lifespan. Concrete neuroscientific research projects are motivated by the three big questions in Neurosciences mentioned above, but they are aimed at answering smaller, more defined sub-questions. Neuroscience research ranges across all biological levels. At the molecular and cellular level, the Neurosciences investigate the processes within and between cells. At the organ level, the investigations focus on how brain cells organize in networks and circuits. At the level of the organism, the Neurosciences investigate brain function such as cognition, emotion and social interaction, including specific abilities such as movement, perception, language, or memory. Finally, at the population level, the field encompasses studies where epidemiological, qualitative approaches, as well as society-directed approaches may be used to investigate financial and political decision-making, and the societal consequences of brain disease. In addition, research in the Neurosciences provides technological innovations that can be used in a broad range of applications; from molecular and genetic approaches for drug/treatment development, to, e.g., artificial brain implants, or to new designs in robotics based on neural principles.

Due to its translational character, the strength of the Neurosciences lies in connecting parts of different sub-disciplines, such as biology, (bio)informatics, psychology, (bio)chemistry, medicine, mathematics, physics, and philosophy. Hence, the Neurosciences cover many elements from those disciplines and are characterised by a profound integration of these elements. In this way, Neuroscience research provides innovative methods and approaches to understanding the brain, behaviour and disease, based on developing insight into brain mechanisms. The Master of Sciences level of education in the Neurosciences aims to teach students about the aforementioned aspects, including the technological, methodological, societal and ethical developments in modern Neuroscience research. Note, however, that each Master programme has its own specific scope and foci, which are reflected by the content and name of the programme.

[1] The general label "The Neurosciences" is chosen here to highlight the broadness of the field and is meant to include programmes with various names, such as "Cognitive Neuroscience", or "Cognitive and Clinical Neuroscience".

General intended learning outcomes of Neuroscience Master programs in the Netherlands

Graduates of the research master within the domain of Neurosciences have an academic attitude and are academically skilled researchers in the field of Neuroscience.

Knowledge and Understanding
Master's graduates:
1. have an overview of the conceptual framework in the field of Neuroscience, including new theories, processes, instruments, and current research challenges;
2. appreciate the integrative scope of the Neurosciences bridging disciplines such as biology, biomedical sciences, psychology, medicine, philosophy, mathematics, and physics;

Applying Knowledge and Understanding
Master's graduates have demonstrated the ability to:
3. acquire, structure and integrate information in the field of the Neurosciences to generate novel hypotheses that further the field, both orally and in writing;
4. conceive, design, implement and adapt neuroscientific experiments;

Making judgments
Master's graduates have demonstrated the ability to:
5. critically analyse and interpret neuroscientific research, in relation to the design and execution of experiments or computational modelling, and the results obtained thereof;
6. reflect on ethical aspects of neuroscience research, and include these in decision-making processes;

Learning focus
Master's graduates have the learning skills:
7. to work in a team and to collaborate with researchers from other disciplines and/or countries;
8. to pursue a career as independent neuroscience researcher either in- or out-side of academia;

Communication
Master's graduates have demonstrated the ability to:
9. discuss neuroscience related topics with peers, the larger scholarly community and with non-researchers who are interested in the Neurosciences, both orally and in writing;
10. efficiently communicate in interdisciplinary research teams.

APPENDIX 2: INTENDED LEARNING OUTCOMES

Master's programme Neurosciences (Research)

Knowledge and Understanding
At all events, a graduate of the study programme will:
1. have an overview of the conceptual framework in the field of neuroscience, including the state of the art in terms of new theories and current research challenges;
2. appreciate the position of the neurosciences within biology, biomedical sciences, medicine and psychology;
3. appreciate the scientific and social relevance of the neurosciences;
4. understand that science is a team effort.

Applying Knowledge and Understanding
At all events, a graduate of the study programme will have demonstrated the ability to:
5. acquire, structure and integrate information in the field of neuroscience to generate novel hypotheses that further the field;
6. conceive, design, visualize, analyze, implement and adapt own neuro-scientific data and experiments;
7. produce written reports and verbal research presentations in English;

Making judgments
At all events, a graduate of the study programme will have demonstrated the ability to:
8. critically analyse and interpret neuro-scientific research, in relation to design, performance, and results obtained;
9. evaluate their performance as neuro- scientific researcher, both introspectively and in conversation with others;
10. think in multidisciplinary terms;
11. reflect on ethical aspects of neuroscience research, and include these in decision making processes;

Learning focus
At all events, a graduate of the study programme will have the learning skills:
12. to further study in a largely self-directed or autonomous manner;
13. to collaborate with researchers from other disciplines;
14. to pursue a career as independent neuroscience researcher either in- or out-side of academia;

Communication
At all events, a graduate of the study programme will have demonstrated the ability to:
15. contribute to scientific discussions;
16. discuss neuroscience related topics with peers, the larger scholarly community and with society as a whole;
17. efficiently communicate in interdisciplinary research teams.

APPENDIX 3: OVERVIEW OF THE CURRICULUM

Master's programme Neurosciences (Research)

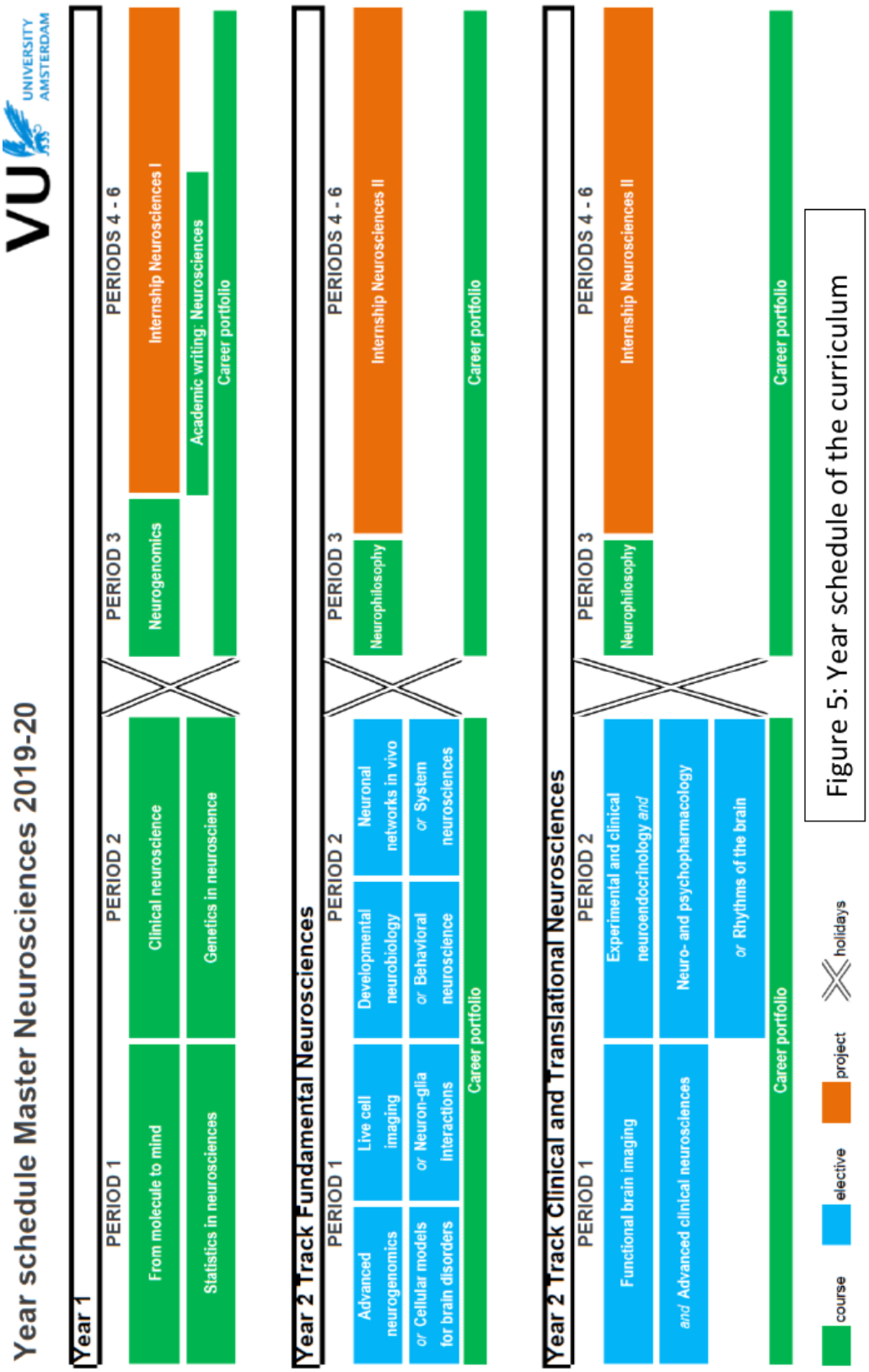

Figure 5: Year schedule of the curriculum

	EXIT QUALIFICATIONS		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
code	course name	# EC	knowledge&comprehension				application			making judgments				learning focus			communication		
AM_1215	From Molecule to Mind	9	×	×					×	×				×		×			
AM_1216	Statistics in Neurosciences	3					×	×	×	×				×		×			
AM_1005	Clinical Neurosciences	6	×	×	×	×	×		×	×		×			×	×	×		×
AM_1214	Genetics in Neuroscience	6	×	×	×		×	×				×				×			
AM_1007	Neurogenomics	6	×	×	×				×	×						×	×		
AM_1123	Academic writing: Neurosciences	3							×	×				×	×	×	×		
AM_471108	Internship Neurosciences I	27	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
AM_1014	Advanced Clinical Neurosciences	6	×	×	×	×	×		×	×	×	×			×	×	×	×	×
AM_470715	Functional brain imaging	6	×	×	×	×	×		×	×	×	×			×	×	×		
AM_1003	Rhythms of the Brain	6	×	×	×	×		×	×	×	×	×			×	×	×		
AM_470718	Neuro- and psychopharmacology	6	×	×	×	×	×	×	×	×	×	×				×	×	×	
AM_470700	Exp. & Clinical Neuroendocrinology	6	×	×	×							×			×	×			
AM_470717	Advanced Neurogenomics	6	×	×	×	×	×	×	×	×	×					×	×		
AM_1218	Cellular models for brain disorders	6	×	×	×	×	×	×	×	×	×	×				×	×		×
AM_470726	Live cell imaging	6	×	×	×	×	×	×	×		×					×	×		
AM_1217	Neuron-Glia Interactions	6	×	×	×		×	×	×	×	×					×	×		
AM_470713	Developmental neurobiology	6	×	×	×	×		×	×	×						×	×		
AM_470728	Methods in Behavioral Neurosciences	6	×	×	×		×		×	×	×	×	×			×	×		
AM_1001	Neuronal Networks in Vivo	6	×	×	×	×			×	×		×				×	×		
AM_470712	Systems neurosciences	6	×	×	×		×	×	×	×	×	×	×			×	×		
AM_1018	Neurophilosophy and Ethics	3		×	×					×	×		×		×	×	×	×	
AM_471109	Internship Neurosciences II	25	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
AM_471110	Literature Survey Neurosciences	8	×	×	×	×		×	×	×	×	×		×		×	×	×	×

Figure 2. Relation between intended learning outcomes (exit qualifications), Dublin Descriptors and coverage by the program modules and courses

APPENDIX 4: PROGRAMME OF THE SITE VISIT

Monday 18 November 2019

08.45	-	09.00	Welcome panel, preparation
09.00	-	10.30	Internal consultation committee + viewing documents
09.30	-	10.00	Office hour (open spreekuur)
10.30	-	10.45	Interview programme management + formal management
10.45	-	11.30	Interview programme management
11.30	-	12.15	Interview students and alumni
12.15	-	13.00	Lunch + preparation meetings
13.00	-	13.45	Interview lecturers
13.45	-	14.30	Interview Examination Board
14.30	-	15.00	Internal consultation committee
15.00	-	15.45	Final interview management
15.45	-	17.15	Internal consultation committee
17.15	-	17.30	Presentation findings and closing

APPENDIX 5: THESES AND DOCUMENTS STUDIED BY THE PANEL

Prior to the site visit, the panel studied 15 final projects (the three capstones) of alumni of the master's programme Neurosciences. Information on the selected alumni and documents is available from QANU upon request.

During the site visit, the panel studied, among other things, the following documents (partly as hard copies, partly via the institute's electronic learning environment):

- Self-evaluation report
- Domain specific reference frame for master's level educational programmes in the Neurosciences
- Intended learning outcomes of the programme (Exit Qualifications)
- Overview of exit qualifications per course
- Vrije Universiteit Amsterdam's Educational Vision
- Rubrics used to evaluate the applicants during the selection procedure
- Study guide of the programme (containing information on the objectives, content, teaching methods and assessments of the courses)
- Placement manual 2018 – 2019
- Overview of Graduate Portfolio Components
- Overview qualification educational staff
- Teaching and Examination Regulation (TER) 2019-2020
- Assessment Policy Faculty of Science (Dutch)
- Programme Assessment Plan
- Assessment Information per Course
- Annual programme report 2018-2019
- Annual report Examination Board HLS-EEE 2017- 2018 and 2018-2019 *(Health and Life Sciences – Earth, Ecological and Environmental Sciences)*
- Rules and Regulations Exam Committee – 2019-2020
- Annual report Programme Committee 2018-2019
- Amsterdam Neuroscience Annual report 2018
- Overview Graduates 2013 – 2018 (numbers, grades)
- Leaflet Student Support
- NSE 2019 results Master Neurosciences
- Management Information Report (e.g. success and drop-out rates)
- Career & Academic Skills Portfolio
- Neurasmus partnershipagreement (2017)
- Quality policy BETA (Dutch only; Kwaliteitszorg Onderwijs Bèta)
- Courses | Exam dossiers
    a. Neurogenomics (year 1 course)
        i. Exam report 2018-2019
        ii. Exam group 1 2018-2029 - including key
        iii. Exam group 2 2018-2029 - including key
        iv. Exam group 3 2018-2029 - including key
        v. Assessment matrix
        vi. Grades 2018-2019
        vii. Course evaluation 2018-2019
    b. Clinical Neuroscience (year 1 course)
        i. Exam report 2018-2019
        ii. Partial exam 1 2018-2029 - including key
        iii. Partial exam 2 2018-2029 - including key
        iv. Assessment matrix
        v. Grades 2018-2019
        vi. Course evaluation 2018-2019
    c. Live Cell Imaging (year 2 course)
        i. Exam report 2018-2019
        ii. Exam 2018-2029 - including key

iii. Assessment matrix
iv. Grades 2018-2019
v. Course evaluation 2018-2019

d. Neural Networks in Vivo (year 2 course)
i. Exam report 2018-2019
ii. Exam 2018-2029 - including key
iii. Assessment criteria
iv. Assessment matrix
v. Grades 2018-2019
vi. Course evaluation 2018-2019