Computational Science

Faculty of Sciences,
University of Amsterdam

Quality Assurance Netherlands Universities (QANU)
Catharijnesingel 56
PO Box 8035
3503 RA Utrecht
The Netherlands

Phone: +31 (0) 30 230 3100
Telefax: +31 (0) 30 230 3129
E-mail: info@qanu.nl
Internet: www.qanu.nl

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This report was finalized on 10 December 2013

Report on the master's programme Computational Science of University of Amsterdam

This report takes the NVAO's Assessment Framework for Limited Programme Assessments as a starting point.

Administrative data regarding the programme

Master's programme Computational Science

Name of the programme:	Computational Science
CROHO number:	30299
Level of the programme:	master's
Orientation of the programme:	academic
Number of credits:	120 EC
Specializations or tracks:	none
Location(s):	Amsterdam
Mode(s) of study:	full time
Expiration of accreditation:	31-12-2014

The visit of the assessment committee Computer Sciences to the Faculty of Sciences of University of Amsterdam took place on 16-18 October.

Administrative data regarding the institution

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

Quantitative data regarding the programme

The required quantitative data regarding the programme are included in Appendix 5.

Composition of the assessment committee

The committee that assessed the master's programme Computational Science consisted of:

- Prof. dr. J. Paredaens (chairman), retired professor in Database Research, Antwerp University;
- Prof. dr. L. Bijlsma (member), professor in Education and Software Construction and Vice-Dean of the Faculty of Management, Science and Technology, Open University;
- Prof. dr .ir. B. Preneel (member), professor in Information Security, KU Leuven;
- Prof. dr. S. Mauw (member), professor in Security and Trust of Software Systems, University of Luxembourg;
- R. Verbij BSc (member), student Computer Science, University of Twente.

The committee was supported by dr. B.M. van Balen, who acted as secretary.

The University of Amsterdam board and the Accreditation Organisation of the Netherlands and Flanders (NVAO) agreed to the composition of the assessment committee. Appendix 1 contains the curricula vitae of the members of the committee. All members of the committee and the secretary signed a declaration of independence as required by the NVAO protocol to ensure that they judge without bias, personal preference or personal interest, and the judgement is made without undue influence from the institute, the programme or other stakeholders. The committee invited an external referent, prof.dr. B. Chopard from the University of Geneva, to give an expert opinion on the programme. The report by this external referent is used to consolidate the assessment by the committee.

Appendix 1 contains the curricula vitae of the members of the committee.

Working method of the assessment committee

The assessment of the master's programme Computational Science was part of an assessment cluster. In total, the committee assessed 26 programmes from ten universities: Delft University of Technology, Open University, University of Groningen, Eindhoven University of Technology, Utrecht University, University of Amsterdam/VU University Amsterdam, Radboud University Nijmegen, Leiden University and University of Twente.

The assessment committee Computer Science 2013 consisted of ten members:

- Prof.dr. J. Paredaens (chair), retired professor in Database Research, Antwerp University;
- Prof.dr. L. Bijlsma (member), professor in Education and Software Construction and Vice-Dean of the Faculty of Management, Science and Technology, Open University;
- Prof.dr.ir. B. Preneel (member), professor in Information Security, KU Leuven;
- Prof.dr. J. van den Herik (member), professor in Computer Science, Tilburg University;
- Prof.dr.ir. K. De Bosschere (member), professor in Computer Science, Ghent University;
- Prof.dr. S. Mauw (member), professor in Security and Trust of Software Systems, University of Luxembourg;
- Prof.dr. S. Mullender (member), Director of the Network Systems Laboratory at Bell Labs, Antwerp and professor Systems Research, University of Twente;
- Prof.dr.ir. W. Van Petegem (member), associate professor and Director Teaching and Learning, KU Leuven;
- P. Boot Bsc (member), student Computer Science, Utrecht University;
- R. Verbij Bsc (member), student Computer Science, University of Twente.

Preparation
The committee held a preliminary meeting on April 26, 2013. During this meeting the committee was instructed about the accreditation framework and the programme of the upcoming assessments. A vice-chair for each visit was appointed and the Domain Specific Framework for Computer Science was set (see Appendix 2).

To prepare the contents of the site visits, the coordinator first checked the quality and completeness of the Critical Reflection Reports prepared by the programmes. After establishing that the Reports met the demands, they were forwarded to the participating

committee members. The committee members read the reports and formulated questions on their contents. The coordinator collected the questions and arranged them according to topic.

Besides the Critical Reflection Report, the committee members read a selection of fifteen theses for the master's programme. The theses were randomly chosen from a list of graduates of the last two completed academic years within a range of grades. Four additional theses were selected for review by the external reviewer. The committee therefore studied 19 master's theses.

Site visit
A preliminary programme of the site visit was proposed by the coordinator and adapted after consultation of the committee chairman and the coordination team of the University of Amsterdam. The timetable for the visit in Amsterdam is included as Appendix 6.

Prior to the site visit, the committee asked the programmes to select representative interview partners. During the site visit, meetings were held with panels representing the faculty management, the programme management, alumni, the programme committee and the Board of Examinators. Meetings were also held with representatives of the students and teaching staff. Well in advance of the visit, the committee approved a list of the selected interview partners.

During the site visit, the committee examined the material it had requested; an overview of this material is given in Appendix 7. Outside of the set interviews, the committee gave students and lecturers the opportunity to speak informally to the committee during a consultation hour. No applications were received for this option.

The committee used the final part of the visit for an internal meeting to discuss the findings. The visit was concluded with a public oral presentation of the preliminary impressions and general observations by the chair of the committee.

Report
Based on the committee's findings, the coordinator prepared a draft report. This report was presented to the committee members involved in the site visit. After receiving approval, the draft report was sent to the Faculty with the request to check it for factual inaccuracies. The coordinator discussed the comments received from the Faculty with the committee chairman. The final version of the report was then sent to the committee members for a final check. Subsequently, the definitive report was approved and sent to the University of Amsterdam.

Decision rules
In accordance with the NVAO's Assessment Framework for Limited Programme Assessments (as of 22 November 2011), the committee used the following definitions for the assessment of both the standards and the programme as a whole.

Generic quality
The quality that can reasonably be expected in an international perspective from a higher education bachelor's or master's programme.

Unsatisfactory
The programme does not meet the current generic quality standards and shows serious shortcomings in several areas.

Satisfactory
The programme meets the current generic quality standards and shows an acceptable level across its entire spectrum.

Good
The programme systematically surpasses the current generic quality standards across its entire spectrum.

Excellent
The programme systematically well surpasses the current generic quality standards across its entire spectrum and is regarded as an (inter)national example.

Summary judgement

Standard 1
The Master Computational Science is a joint programme offered by the University of Amsterdam (UvA) and the VU University Amsterdam (VU). The heart of the curriculum is described as the research and development of the algorithmic and computational means to solve problems. Part of the programme's core is formed by advanced techniques such as large-scale distributed computing and massively parallel processing. It includes novel paradigms such as quantum information processing (e.g. the course Quantum Computing is one of the elective courses in the curriculum), but also less traditionally applied methods from computational intelligence such as evolutionary and bio-inspired computing.

The committee has studied the intended learning outcomes and the Domain specific Framework of Reference (DFR) and established that the learning outcomes defined for the master's programme Computational Science are in line with the DFR and with the level according to international requirements for academic master's degree programmes.

The committee established the programme has a unique and highly valued profile. The committee appreciates the cooperation with the VU, which enables both universities to offer two full master's programmes in the Computer Science discipline and in particular enables this unique Computational Science programme. The combination of expertise of the two involved Faculties certainly adds to the quality of the master's programme..

Standard 2
In the two-year master's programme the first year is dedicated to core Computational Science courses covering computing & algorithms, modelling & simulation, massive-data processing, and horizontal skills and the second year to elective courses and the master research project. The curriculum distinguishes two learning lines: (1) Computing, and (2) Modelling and Simulation. In the first line students can select core courses oriented towards distributed and parallel computing, while in the second line students can decide to take core courses oriented towards Modelling and Simulation

The committee is of the opinion that the programme is well organised and that the students are well prepared for obtaining their final qualifications. The master's programme Computational Science is an attractive programme that enables the students to achieve the intended learning outcomes and to develop academic and research skills. It prepares them sufficiently for the master's thesis.

The committee recommends continuing the efforts to spread the information about the programme in order to attract more students and to offer a 'pre-master' course in programme-focused mathematics for candidate students with deficiencies who want to prepare themselves for their studies. Furthermore, it advises to reconsider the schedule of the first year of the programme.

The quality of the teaching staff is good. The programme oriented facilities are adequate, but the growing student numbers could put these under pressure. The committee noticed that the programme management is aware of this risk. The programme oriented quality assurance is adequate. However, the committee recommends the programme committee to be more proactive. It also recommends to sternghten the involvement of alumni with the programme.

Standard 3
The committee has established that the Board of Examinators has started to develop a transparent, reliable and valid assessment system and recommends proceeding with the implementation of this system according to the line described in the 'Kader Toetsbeleid' (Framework Testing Policy) of the UvA. The procedure for the assessment of the master's theses is much appreciated by the committee.

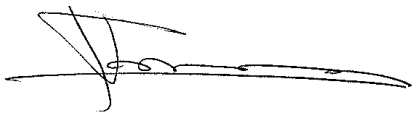
The committee has studied 15 master's theses. All theses show that the students have achieved the intended learning outcomes of the master's programme. All master's theses are of an adequate academic level. The committee found some of the theses outstanding, which is underlined by the list of scientific papers that resulted from graduation research projects. Several theses show a high quality and an interdisciplinary dimension. The committee has established the students achieve the intended learning outcomes of the master's programme.

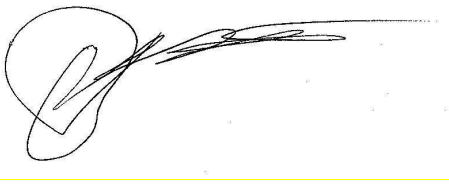
The committee assesses the standards from the Assessment framework for limited programme assessments in the following way:

Standard 1: Intended learning outcomes	good
Standard 2: Teaching-learning environment	satisfactory
Standard 3: Assessment and achieved learning outcomes	satisfactory
General conclusion	satisfactory

The chair and the secretary of the committee hereby declare that all members of the committee 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: 10 December 2013





Prof. dr. J. Paredaens

dr. B.M. van Balen

Description of the standards from the Assessment framework for limited programme assessments

The Master Computational Science is a joint programme offered by the University of Amsterdam (UvA) and the VU University Amsterdam (VU).

In the Spring of 2011, the deans of the involved faculties of the UvA and the VU decided to explore the option of two interuniversity master's programmes, one in Computer Science, the other in Computational Science. The former would be based on the existing Master Computer Science at the VU University Amsterdam; the latter would be built upon the Master Grid Computing. In September 2012, the Master Grid Computing started with a new single-track curriculum in Computational Science, jointly offered by the University of Amsterdam and VU University Amsterdam. Likewise, the Master Computer Science at VU University Amsterdam is now jointly offered by both universities.

Standard 1: Intended learning outcomes

The intended learning outcomes of the programme have been concretised with regard to content, level and orientation; they meet international requirements.

Explanation:
As for level and orientation (bachelor's or master's; professional or academic), the intended learning outcomes fit into the Dutch qualifications framework. In addition, they tie in with the international perspective of the requirements currently set by the professional field and the discipline with regard to the contents of the programme.

Findings

In this paragraph the findings of the committee in regard to the Domain Specific Requirements Framework and intended learning outcomes, the level and orientation of the programme are described. After considering the findings, the committee comes to a conclusion and assessment of Standard 1.

Profile
The heart of the curriculum is described as the research and development of the algorithmic and computational means to solve problems. Computing infrastructures advance at such a pace, and scientific data is being produced and consumed in ever-increasing volumes in all branches of science, that students need to be educated to invent and develop new solutions for data-intensive and computationally demanding problems.

Part of the programme's core is formed by advanced techniques such as large-scale distributed computing and massively parallel processing. It includes novel paradigms such as quantum information processing (e.g. the course Quantum Computing is one of the elective courses in our curriculum), but also less traditionally applied methods from computational intelligence such as evolutionary and bio-inspired computing. Moreover, creating novel algorithms for solving real-world computational problems starts with models that form an abstraction of those problems. For this reason, being able to understand and apply those models, as well as transform them into efficiently executable algorithms is a crucial part of the programme.

The committee discussed the profile and the name of the programme with the management and teachers during the site visit and asked whether this name does not lead to confusion and lack of visibility. Usually computational science programmes are embedded in mathematics, physics or chemistry departments. The management and teachers, however, convinced the committee that the programme benefits from the unique position in the Computer Science department. Computational science is a multidisciplinary field. In the view of the management and teachers the name is perfect and does justice to what is taught.

The committee concurs with the management and teachers that the programme has a unique profile and learnt from the interviews with the students that this profile is highly valued. The committee advises to pay attention to dissemination of the information about this programme and its profile.

The committee appreciates the cooperation with the VU, which enables both universities to offer two full master's programmes in Computer Science and in particular enables this unique Computational Science programme. The combination of expertise of the two involved Faculties certainly adds to the quality of the master's programme.

Intended learning outcomes
The learning outcomes of the programme are described in Appendix 3 of this report; they refer to both research skills and other academics skills (like social awareness, attitude, and critical reflection). The programme trains knowledge, understanding, and academic skills founding upon and enhancing the level that is typically associated with the bachelor's level, i.e. the graduate masters specialized knowledge, and is able to apply knowledge and understanding, formulate judgements, and communicate in more complex situations. The intended learning outcomes are explicit about the high level that is required from the students. They clearly distinguish between the bachelor's and the master's level. The graduate in Computational Science, according to these intended learning outcomes, has a thorough knowledge of modelling and simulation of complex systems, computational methods and techniques and the application of computational methodologies in application fields. The programme aims to prepare students for entry into a PhD programme in Computational Science or related disciplines, or into research positions outside academia. The intended learning outcomes are specifically tailored towards this orientation. The critical reflection clearly describes how the intended learning outcomes are related to the Dublin-descriptors, indicating that the level and orientation of the intended learning outcomes are in line with the international requirements for master's programmes.

The committee has verified that the intended learning outcomes are in line with the domain specific requirements. The learning outcomes indicate in a clear way that the programme aims at a master's degree level.

Considerations

The committee has established that the learning outcomes defined for the master's programme Computational Science are in line with the Domain specific Framework of Reference and with the level according to international requirements for academic master's degree programmes.

The committee is positive about the cooperation with the VU and appreciates the unique profile of the master's programme Computational Science.

Conclusion

Master's programme Computational Science: the committee assesses Standard 1 as 'good'.

Standard 2: Teaching-learning environment

The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes.

Explanation:
The contents and structure of the curriculum enable the students admitted to achieve the intended learning outcomes. The quality of the staff and of the programme-specific services and facilities is essential to that end. Curriculum, staff, services and facilities constitute a coherent teaching-learning environment for the students.

Findings

The committee has studied the curriculum of the master's programme Computational Science, and has seen the course material, the digital learning environment and results of course evaluations. In this standard the findings of the committee concerning the content and structure of the programme, intake and study load, the teaching staff and the facilities are discussed.

The curriculum
In the two-year master's programme, the first year is dedicated to core Computational Science courses covering computing & algorithms, modelling & simulation, massive-data processing, and horizontal skills (such as advanced programming) and the second year to elective courses and the master research project. A distinction between core courses, constrained choice courses and electives is made. The core courses reflect the central body of knowledge in Computational Science: modelling, simulation, and computing. Students should study a substantial part of the topics offered in the core. The constrained choices offer breadth and depth, allowing students to either deepen their knowledge on core topics or broaden their scope. The electives offer students the option to take courses in application domains. These are designed especially for students who would like to do a research graduation project in one of the application domains. Students can also use their electives to further deepen their knowledge in the core. Introduction to Computational Science is obligatory for all students, unless a student already obtained all required knowledge in his/her bachelor education. The main goal of this course is to synchronize all students, that is, to offer individual students the possibility to work on gaps in their knowledge (e.g. advanced programming, refreshing topics from mathematics). Students finalize the course with a mini-project.

Two learning lines are distinguished in the curriculum (see also Appendix 4)

- Computing
- Modelling and simulation

In the first line students can select core courses oriented towards distributed and parallel computing (e.g. the courses Distributed Systems, concurrency and multi-threading), while in the second line students can decide to take core courses oriented towards Modelling and Simulation (e.g. the courses Stochastic Simulation and Scientific Computing). Hybrids between both learning lines are also possible.

The second year is for the bigger part dedicated to the research project of 36 EC + 6 EC literature project. In the remaining 18 EC courses can be elected that should prepare for the research project (12 EC). In both the first and second year, students attend the Seminar Computational Science (6 EC in total for the 2 years).

The didactic concept can best be characterised as "independent supervised learning"; the programme expects an independent learning style of its students. A mix of working styles and examination methods is used. The graduation project is a key component in the didactic strategy. The projects involve gathering and interpreting data, possibly through the simulation or modelling of complex systems in software, analyzing and making judgments on that data and communicating knowledge, observations and conclusions to an examining committee, members of which will not necessarily have expert knowledge in the specific field of research undertaken. The projects should add to the body of knowledge in Computational Science, demonstrating the ability of students to perform original scientific research and communicate that to their peers.

In line with this ambition, one of the targets of the graduation project is that the results will be presented at a conference and published. The committee discussed this ambition with the programme management, as it seems that this goal was until now reached by only a few of the graduates. The programme management assured the committee that more publications are in the pipeline. Even so, the committee advises to either reformulate the goal, or give the students more guidance and tools to reach the goal.

The students mentioned that the two courses scheduled in the first semester of the programme are different in intensity. The Introductory course is for the majority of the students quite loose and does not require much effort. The Numerical Algebra course, however, is difficult and challenging and therefore swallows up all time and effort of the students at the expense of the attention for the other course. The students suggest rescheduling the courses in order to balance the study load of and attention for both courses. Furthermore, the students mentioned that elective courses are mainly scheduled in the first half of the year and that the choice in the second half of the year is limited.

The committee discussed the programme with teachers and with students and concludes that an attractive coherent programme is offered in line with the intended learning outcomes and the interests of the students. The programme enables the students to achieve the intended learning outcomes and to develop their research skills. The committee advises to reconsider the schedule of the first year of the programme.

Intake and study load and study guidance
Data on intake and progress in the master's programme are presented in Appendix 5.

The intake in 2011-2012 was very low. The reason for this low intake is, according to the management, that the programme was relatively unknown. The management has put a lot of effort in restructuring the programme to make it more attractive. The intake recently increased to 18 students. The ambition of the programme is an inflow of 30 students.

The background of the students is very diverse, only a minority of the students graduated from the bachelor's programme Computer Science at the UvA. For all applicants an individual intake is done. When necessary, students are advised to do a bachelor course Modelling and Simulation in preparation. In order to bring all students to the same level of knowledge and skills the Introduction to Computational Science is mandatory. The discussion with the students taught the committee that students with a background in computer science, artificial intelligence or mathematics have no problems with the level of, and the study load in, the master's programme. Students with a different background or deficiencies in Mathematics and Computer science mentioned that they have to study hard to catch up, but they find the programme feasible. Some students mentioned that they would have liked to do

a summer course in Mathematics in order to catch up with the level of the master's programme. Some students prepared themselves during the summer by self-studying, but said that the information on what kind of mathematics they needed was not correct. The committee advises to offer a structured and focused study course for students with deficiencies, which they can do individually in preparation for the master's programme.

There is one student advisor (0.8 fte) for all students in the six master's programmes in informatics. The student advisor assists in matters relating to study planning, study programmes and course switching. The committee considers the availability of the study advisor as too low. This problem will grow in the following years when student numbers will increase further. The students, however, had no problems with the availability. They mentioned that they discussed their study programme with the teachers, who are very accessible and supportive.

The committee concluded that the master's programme is feasible and that the study guidance of students is sufficient. However, the committee recommends to offer a 'pre-master' mathematics course for students with deficiencies and to extend the formation for study advisors in line with the increasing student numbers.

Teaching staff
The master's programme is taught by staff employed by UvA (1.13 fte) and VU (1.1 fte). All staff involved holds a PhD degree. The aim of the programme management is to provide all teachers with sufficient didactical support. New teachers will follow a didactical and educational trajectory (BKO: *Basis Kwalificatie Onderwijs*) to improve and develop their teaching competences. Existing staff will also (need to) follow a BKO course (tailored to the person in question and his/her experience). This course should be finished within in the first two years of their assignment. It is the target of the programme management that in the study year 2015-2016, 90% of the teachers will be BKO certified.

The Faculty of Science has a system for quality control of scientific personnel (UFO). In this system, it is clearly stated what the core activities, deliverables and the targeted results are for each person and corresponding position. Further, the teaching activities are monitored by the yearly evaluation of each employee. The teaching activities include preparation, development, execution, didactics and examination. The yearly evaluation is based on the information about the lecturer provided by the digital portfolio in which activities and results are stored for both teaching and research.

The students are satisfied with the quality of the teachers; they appreciate their accessibility and feel sufficiently supervised. The committee concludes that the quality of the teaching staff is good.

Programme specific facilities
The committee was able to get an impression of the building that houses the programme and discussed the facilities with students and teachers. The students have a lot of appreciation for the appearance and atmosphere of the building. The computer and study facilities in the building, however, are - due to the growing student numbers - increasingly under pressure. Teachers mentioned that it is often difficult to find bigger lecture rooms for the increased number of students. An indication of the problems the programme faces is the fact that the presentation of the preliminary findings of the assessment committee took place in the canteen. The programme management is aware of these issues and is searching for solutions.

Programme specific quality assurance
The programme has organised its quality assurance system in accordance with the format provided by the Faculty of Science Education Quality Assurance Manual. Within the master's programme, Computational Science courses are evaluated by means of an inquiry form. The inquiry is held during the final written exam, or during one of the last course lectures. The output of the inquiry is discussed by the programme committee, which meets four times a year. The committee receives the evaluation results and information from the student members of the committee. Based upon this information suggestions for change may arise. If there are problems, an advice is sent to the programme director.

The committee established that the quality assurance system is functioning in a satisfactory manner. The gathering of evaluation results enables the programme to signal and solve bottlenecks in the curriculum. The system also enables the students to participate in education policy and quality assurance. Nevertheless, the committee got the impression that students do not really feel involved. The programme committee should act more proactively. The frequency of meetings is rather low and the agenda is mainly determined by the discussion of the results of the evaluation questionnaires. The committee recommends the programme committee to focus on education policy development. Furthermore feedback to the students on the results of the course evaluations could be improved.

The committee noticed that the programme has no structural contacts with alumni. It advises to establish an alumni association and use the information of alumni in the quality assurance process.

Considerations

The committee is of the opinion that the programme is well organised and that the students are well prepared for obtaining their final qualifications. The master's programme Computational Science is an attractive programme that enables the students to achieve the intended learning outcomes and to develop academic and research skills. It prepares them sufficiently for the master's thesis.

The committee recommends continuing the efforts to spread the information about the programme in order to attract more students and to offer a 'pre-master' course in programme-focused mathematics for candidate students with deficiencies who want to prepare themselves for their studies. Furthermore it advises to reconsider the schedule of the first year of the programme.

The quality of the teaching staff is good.

The programme oriented facilities need attention. Due to the growing student numbers there is a shortage of computer places for the students and a need for more large sized lecture rooms. The committee noticed that the programme management is aware of these needs.

The programme oriented quality assurance is adequate. The committee, however, recommends the programme committee to be more proactive. The involvement of alumni with the programme could be strengthened.

Conclusion

Master's programme Computational Science: the committee assesses Standard 2 as 'satisfactory'.

Standard 3: Assessment and achieved learning outcomes

The programme has an adequate assessment system in place and demonstrates that the intended learning outcomes are achieved.

Explanation:
The level achieved is demonstrated by interim and final tests, final projects and the performance of graduates in actual practice or in post-graduate programmes. The tests and assessments are valid, reliable and transparent to the students.

Findings

This section deals with the assessment system and the level achieved by the graduates of the master's programme Computational Science of the University of Amsterdam. These subjects will be described in sub sections. In order to establish an opinion about these subjects the committee studied the assessment system and policy of the programme, the test procedures, test regulations, the used test forms and several tests made by students. The committee also had a meeting with the Board of Examinators responsible for the master's programme.

The committee studied a selection of master's thesis to assess the achieved level of the graduates and had discussions with the students, teachers, and alumni about the qualifications of the graduates and the relation with the requirements of the labour market.

Assessment system
The critical reflection indicates that a department-wide examination policy is being developed, following the "Kader Toetsbeleid" (Framework Testing Policy) of the University of Amsterdam. The goals of the examination policy are: to set clear learning targets for every course, to set guidelines for creating exams, to make a list of criteria for assessing graduation projects and to create assessment matrices and marking criteria for exams. Implementing a system of peer review of exams is also considered by the programme.

All teachers are in the process of following the mandatory BKO for professionalization. The next step is that courses should be aligned by a series of teachers' team meetings at the start of each block, sharing and refining the learning goals of each course. Furthermore, assessment matrices and examination criteria are to be discussed and implemented in the courses as part of departmental educational policy.

The Board of Examinators (BoE) consists of three members. At this moment all members are staff members from the UvA, recently a procedure was initiated to add a staff member from the VU to the BoE. Its main roles are the processing of requests for exceptions, the execution of an examination policy (Toetsbeleid), acting as a first judge of appeal, and processing cases of fraud and plagiarism and extraneous admissions. At the moment, the BoE relies on student complaints and clues from various sources, such as course evaluations and student surveys, to measure the quality of exams.

In the master's programme Computational Science written exams are the standard way of assessment. Other forms used are homework, oral presentations, lab assignments and reports, discussion of papers and the final master's thesis. The master's thesis is assessed by a committee of at least three persons including the supervisor. If the master's research project has been carried out in industry or other research institutes, supervisors of the hosting institute also join the committee. A member of the Board of Examinators chairs the committee The graduation exam takes around 1 hour, consisting of 20 minutes of

presentation by the student, and 40 minutes questioning by the BoE. To provide transparency on the grades, the Board of Examinators has started using formal scoring forms.

The committee has noticed that the BoE just recently started to implement the new mandates of BoE's and to develop a reliable and valuable assessment system. The committee has established that the assessment form for master's theses was not yet available for all the master's theses that the committee selected. The assessment of the master's thesis by a committee of at least three persons, however, is very much appreciated by the committee. This procedure fosters the validity and reliability of the assessment. The committee recommends the BoE to speed up the implementation of the examination policy in the line of the 'Kader Toetsbeleid' by the UvA and to ensure that all master's theses are assessed by making use of an assessment form.

The committee recommends to set a clear policy for plagiarism and to supervise the implementation of this policy

Achieved learning outcomes
The committee has studied 15 master's theses. All theses show that the students have achieved the intended learning outcomes of the master's programme. All master's theses have an adequate academic level. The committee found some of the theses outstanding, underlined by the fact that these projects resulted in scientific papers. Several theses show a high quality and an interdisciplinary dimension. The choice of topics for the theses is relevant in view of the intended learning outcomes of the programme. Although, as indicated under standard 2, not all master's theses resulted, as yet, in publications, the committee appreciates the ambition set by the programme management.

Considerations

The committee has established that the Board of Examinators has started to develop a transparent, reliable and valid assessment system. The committee recommends to proceed with the implementation of this system in line with the 'Kader Toetsbeleid' of the UvA. The procedure followed by the assessment of the master's theses is much appreciated by the committee.

The committee has established that the students achieve the intended learning outcomes of the master's programme.

Conclusion

Master's programme Computational Science: the committee assesses Standard 3 as 'satisfactory'.

General conclusion

The committee concluded that the master's programme Computational Science of the University of Amsterdam has the quality that can be expected in an international perspective from a higher education master's programme.

Conclusion
The committee assesses the *master's programme Computational Science* as 'satisfactory'.

Appendices

Appendix 1: Curricula Vitae of the members of the assessment committee

Prof. em. J. (Jan) Paredaens was a professor at the University of Antwerp and is now dean of the Faculty of Design Sciences at the same university. He graduated as a mathematician from the Free University of Brussels and was awarded his doctorate in 1974 from the Free University of Brussels. He worked until 1979 in the research centre of the company MBLE in Brussels. In 1979 he was appointed lecturer in Informatics at the University of Antwerp. He filled various positions, including Dean of the Sciences Faculty. He has already been a member of the Informatics review committee in the Netherlands. His scientific specialisation is 'Databases and Data mining', on which he has published over 100 international scientific articles. He has also organised a number of international conferences in his subject and is a member of the 'Executive Committee of PODS' in the USA. He was member/chair of numerous Belgian and international committees and panels.

Prof. dr. Lex Bijlsma (1949) is professor Education and Softwareconstruction and vice-dean of the Faculty Management, Sciences and Technology, Open University. He graduated in mathematics in 1973 at the University of Amsterdam and did a PhD on theory of numbers at the same university in 1978. Thanks to a ZW grant he could do research at the *Institut des Hautes Etudes Scientifiques in Bures-sur-Yvette* in 1978-79. In 1979 he became assistant professor at the Eindhoven University of Technology and specialised in computer science. In 1999 Bijlsma was appointed associate professor at Utrecht University, in 2000 director of education computer science and in 2011 also director of education in informatics. In 2007 he was appointed full professor at the Open University. His interest concerns programming methodology, mathematical methods in computer science and software-architecture.

Prof.dr. ir. Bart Preneel is professor at the Department Electrical Engineering-ESAT of the KU Leuven. He received his PhD in 1993 at the KU Leuven in the area of cryptology. He is head of the research group COSIC that foscuses on cryptology, information security and privacy. He was research fellow at UC Berkeley, guest lecturer at 5 universities and academic advisor of Philips. He is president of the IACR (International Association for Cryptologic Research) and member of the Permanent Stakeholders group of ENISA (European Network and Information Security Agency). He participated in several scientific committees, among which: ERC, EPSRC, FNRS, NSF, NWO and STWW.

Prof. dr. Sjouke Mauw is professor computer security at the University of Luxemburg since 2007. After studying Mathematics at the University of Amsterda, he obtained his PhD in Informatics at the same university. After teaching as an assistence professor at the University of Amsterdam, he was appointed assistant (1992) and later associate (1999) professor at Einhoven University of Technology. He has been a research fellow at the CWI in Amsterdam. At the university of Luxemburg, Mauw leads a research group focusing on the application of formal methods in the areas of security and trust. He, furthermore, has published in various different academic fields, such as process algebra, domain-specific languages, texts, distributed algorithms and bio-informatics.

R. (Ruud) Verbij, Bsc, is a student of the master in Computer Science, security specialisation track, of the University of Twente, Radboud University of Nijmegen and the Technical University of Eindhoven. As a student Ruud has committed himself to education, for example by being on the education evaluation committee for 3 years, the programme committee for 2 years and a full-time year on the board of his student association. Since September 2010 Ruud has been a student panel member for the accreditation of initial programmes for the NVAO and since September 2012 also for institutional reviews. In January 2013 Ruud set up his own consultancy firm in the field of programme accreditation.

Appendix 2: Domain-specific framework of reference

Domain-specific frame of reference for Master's courses in Computer Science

1. Learning outcomes in general
The Dublin descriptors indicate in general terms what levels a student should reach in knowledge and understanding, the application of knowledge and understanding, forming judgments, communication and learning skills to award him the master's title. In the objectives and content of a Master's degree module it must be clear that teaching and assessment of students aims at reaching the goals set in the Dublin descriptors. They are as follows.

Students to whom a Master's degree is awarded:

- Have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with Bachelor's level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research[1] context;
- Can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study;
- Have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements;
- Can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously;
- Have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous.

Domain specific contents, the nature of Master degree modules
The Master's degree module will build upon knowledge and understanding at undergraduate level. The core of this knowledge and understanding is as described by the Joint Task Force for Computing Science Curricula of ACM/IEEE-CS in their (draft) report "Computing Science Curricula 2013" (http://cs2013.org). The contents of the Master's degree programme should lead the student towards the frontiers of design and applications in the field, and/or towards the major research issues in the field.
The students in the Master's degree module will generally concentrate on subjects in a limited specialisation within the field, or in the border region with adjacent fields. If the module borders on adjacent fields (Management Sciences, Electrical Engineering and Telecommunication, Cognitive Science, …) it will meet international standards which are not necessarily only the standards set for Computing Science Curricula. In particular such modules have identified a (international) community of modules of a similar nature and they will fit the standards of that community.
The Master's degree module may not aim at educating students to be researchers, or it may have tracks for students who do not aim at such a goal. There is however always a strong relationship between the degree module and research activities, and researchers are active as lecturers and supervisors in the degree module.

[1] research' is used to cover a wide variety of activities, with the context often related to a field of study; the term is used here to represent a careful study or investigation based on a systematic understanding and critical awareness of knowledge.

Even if a student who is awarded the degree is not trained to be a researcher, he will have a basic understanding of the nature of research, and he will have proven research skills. In each degree module there will be a final project that takes at least one quarter of the entire module. In the final project the student can show his capabilities in each of the five fields of the Dublin descriptors (knowledge and understanding, application of knowledge and understanding, forming judgments, communication and learning skills).

Preparation for a further career in a PhD position or as a highly qualified professional in the field

A talented and successful student in the Master degree module must be educated to a level where he is eligible for a PhD-position. Participation in research projects, especially during the final project must be open to such students.

The Master's degree module must address the development of skills and competencies that are essential for a working professional. It must be possible for students to participate in cooperation with trade and industry, in particular during a final project. This requires the modules to have sufficient contacts within trade and industry.

2. Comparison of 3TU academic criteria by Meijers at al. (2005) and the Domain Specific Frame of Reference for Computer Science (Version dated 14 Nov 2012).

3TU academic criteria	**Domain Specific Frame of Reference**
Competency in one or more scientific disciplines	Demonstrates knowledge and understanding that is founded upon and extends and/or enhances that typically associated with the Bachelor's degree level and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context
Competency in conducting research	Can apply knowledge, understanding and problem-solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the specific field of study
Competency in designing	Can apply knowledge, understanding and problem-solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the specific field of study
Scientific approach	See competency in research and designing
Competency in cooperation and communication	Can communicate conclusions, as well as the underlying knowledge and rationale, clearly and unambiguously to specialised and non-specialised audiences
Basic intellectual skills	Has the learning skills needed in order to continue to study in a manner that is largely self-directed or autonomous
Consideration of the temporal and the social context	Has the ability to integrate knowledge, handle complexity and formulate judgements with incomplete or limited information, while reflecting on social and ethical responsibilities associated with the application of knowledge and judgements

Appendix 3: Intended learning outcomes

The objectives of the Master Computational Science programme at the University of Amsterdam are as follows:

1. To educate students at an academic level to the degree of Master of Science in Computational Science, in order to become active members of the scientific research community in academic institutions as well as in advanced research and development environments.
2. To reach a final level of knowledge and academic skills that will grant access to PhD. programmes in the Computational Science or to other scientific research oriented positions.

The first objective states the aimed level, measured against generally accepted criteria for an academic master's programme and against the requirements from the disciplinary field. The second objective states the explicit goal to qualify graduates to be able to enter research-oriented positions. Both their knowledge of the field, as well as their acquired academic skills are sufficient to enter PhD. programmes in Computational Science. Finally, the programme should also qualify for a career in industry or business, aimed at research-oriented positions. Examples of such positions would be staff at High Performance Computing Centre's (such as SurfSARA), National Research institutes (such as e.g. in the Netherlands, the National Aerospace Laboratory NLR or TNO) or to industry (e.g. ICT business, large multinationals such as Shell, Philips, biotechnological or pharmacological companies, financial institutions such as ING, etc.).

The objectives have been rationalized into the following exit qualifications of the programme:

1. The graduate in Computational Science has a thorough knowledge of modelling and simulation of complex systems, computational methods and techniques and the application of computational methodologies in application fields (ranging from e.g. physics or biology to medical sciences or psychology).
2. The graduate is able to contribute to scientific research in the field of the degree course.
3. The graduate can formulate and solve problems with the aid of abstraction and model forming.
4. The graduate is able to formulate problems both in general terms and in mathematical and technical terms.
5. The graduate is able to clearly express himself/herself both orally and in writing.
6. The graduate is able to analyse, design and implement as part of a team.
7. The graduate has given thought to the social context of the exercise of science in general and the application of computer science in particular.
8. The graduate is able to independently acquire the information and concepts that are necessary when starting up a new project.

These exit qualifications fall into three categories: Computational Science knowledge; focus on scientific research and problem solving; and communication and collaboration skills.

Appendix 4: Overview of the curriculum

YEAR 1

Semester 1			Semester 2		
1.a block 1 September October	1.b block 2 November December	1.c block 3 January	2.a block 4 February March	2.b block 5 April May	2.c block 6 June
Seminars Computational Science (UvA/VU)					
Numerical Algorithms (UvA)	Distributed Systems (VU)	Biosystems data analysis (UvA)	Scientific Computing (UvA)	Large Scale Computing and Infrastructures (VU)	Complex System Simulation (UvA)
Introduction Computational Science (UvA)	Stochastic Simulation (UvA)		Performance of Networks (VU)	Experimental Design and Data Analysis (VU)	
	Constrained Choice	Individual Programming Assignment (VU)	Constrained Choice	Constrained Choice	

YEAR 2

Semester 1			Semester 2		
1.a block 1 September October	1.b block 2 November December	1.c block 3 January	2.a block 4 February March	2.b block 5 April May	2.c block 6 June
Seminars Computational Science (UvA/VU)					
Concurrency and multi-threading (VU)	Literature Study	Graduation Research			
Elective	Elective				

- Both Learning Lines
- LL computing
- LL modeling and simulation

Appendix 5: Quantitative data regarding the programme

Data on intake, transfers and graduates

Table 1: Study success

Cohort	**2008**	**2009**
% Diploma after 3 years	78	80
% Diploma after 4 years	89	90

Table 2: Quality of teaching staff

Degree	**Master**	**PhD**	**BKO**
UvA + VU teaching staff	100%	100%	60%

Teacher-student ratio achieved

Table 3: Student- staff ratio

Ratio for 2013/2014	11.7

In total we have 2.23 FTE of teaching staff (UvA and VU) and 26 students.

Average amount of face-to-face instruction per stage of the study programme

Table 4: Contact hours (average number of clock hours per week)

Year	1	2
Contact hours	11	6

Appendix 6: Programme of the site visit

Dag 1 Woensdag	**16 oktober**	**Locatie VU**
9.00	10.30	Voorbereidend overleg commissie + inzage documenten
10.30	11.00	Management VU en UvA (bestuurlijk verantwoordelijken: decanen en onderwijsdirectie) VU: • Irth • Vermeer • Van Steen UvA BSc IN en MSc GC/CLS: • Karel Jan Schoutens (Decaan FNWI) • Michel Haring (Directeur Onderwijs FNWI) • Jan Bergstra (Directeur IvI) • Andy Pimentel (Directeur Graduate School of Informatics FNWI) • Jeroen Goedkoop (Directeur College of Science FNWI)
11.00	11.45	Opleidingsmanagement Masteropleidingen VU en UvA VU: • Fokkink • Schreiber UvA MSc GC/CLS: • Jaap Kaandorp (Opleidingsdirecteur MSc GC/CLS, FNWI) • Alban Ponse (Coördinator MSc GC/CS, FNWI) • Kristien van Lunen (Opleidingscoördinator MSc GC/CLS, FNWI) Opleidingsmanagement Bachelor-opleiding VU: opleidingsdirecteur VU: • Fokkink • Schreiber
11.45	13.00	Lunch, open spreekuur
13.00	14.00	Docenten Bacheloropleiding VU
14.00	15.00	Studenten Bacheloropleiding VU
15.00	15.15	Break
15.15	16.15	Studenten Masteropleidingen VU
16.15	17.00	Alumni VU (Ba en Ma)
17.00	17.30	Eventueel rondleiding / intern overleg commissie
19.30		Diner (alleen voor cie.)

Dag 2 Donderdag	**17 oktober**	
9.00	10.00	Docenten Masteropleidingen VU
10.00	10.30	Opleidingscommissie VU
10.30	11.15	Examencommissies en Studieadviseur(s) VU (Ba en Ma)
11.15	11.45	Vervoer naar UvA Locatie UvA

12.00	14.00	Lunch en inzage documenten en eventueel rondleiding
14.00	14.30	Opleidingsmanagement Bacheloropleiding UvA UvA BSc IN: • Robert Belleman (Opleidingsdirecteur BSc IN, FNWI) • Babette Sluijter (Opleidingscoördinator BSc IN, FNWI)
14.30	15.30	Docenten Bacheloropleiding UvA UvA BSc IN: • José Lagerberg (Docent BSc IN, FNWI) • Leen Torenvliet (Docent BSc IN, FNWI) • Dick van Albada (Docent BSc IN, FNWI) • Clemens Grelck (Docent BSc IN, FNWI) • Inge Bethke (Docent BSc IN, FNWI) • (Robert Belleman, Docent BSc IN, FNWI: standby)
15.30	16.30	Studenten Bacheloropleiding UvA UvA BSc IN: • Aike van den Brink (Eerstejaars student BSc IN, FNWI) • Marcel Sang-Ajang (Eerstejaars student BSc IN, FNWI) • Tessa Klunder (Tweedejaars student BSc IN, FNWI) • Jordy Perlee (Tweedejaars student BSc IN, FNWI) • Mustafa Karaalioglu (Derdejaars student BSc IN, FNWI) • Robin de Vries (Derdejaars student BSc IN, FNWI)
16.30	17.15	Alumni UvA (Ba en Ma) UvA BSc IN: • Roy Bakker (Alumnus BSc IN, FNWI) • Pascal Mettes (Alumnus BSc IN, FNWI) • Koos van Strien (Alumnus BSc IN, FNWI) UvA MSc GC/CLS: • Narges Zarrabi (Alumnus MSc GC/CLS, FNWI) • Maxim Filatov (Alumnus MSc GC/CLS, FNWI) • Roland Dries (Alumnus MSc GC/CLS, FNWI)
19.30		Diner (alleen voor commissie)

Dag 3 Vrijdag	**18 oktober**	
9.00	10.00	Docenten Masteropleiding UvA UvA MSc GC/CLS: • Rob Stevenson (docent MSc CLS, FNWI, KdV) • Alfons Hoekstra (docent MSc CLS, FNWI, IvI) • Johan Westerhuis (docent MSc CLS, FNWI, SILS) • Mike Lees (docent MSc CLS, FNWI, IvI) • Drona Kandhai (docent MSc CLS, FNWI, IvI) • Maarten van Steen (docent MSc CLS, VU) • Thilo Kielmann (docent MSc CLS, VU) • Jaap Kaandorp (docent MSc CLS, FNWI, IvI)
10.00	11.00	Studenten Masteropleiding UvA UvA MSc GC/CLS: • Merlijn Wajer (MSc Student CLS, 2012)

		• Amir Abdol (MSc Student CLS, 2012) • Camelia Simoiu (MSc Student CLS, 2013) • Merel de Groot (MSc Student CLS, 2013) • Philip Rutten (MSc Student CLS, 2013) • Elte Hupkes (MSc Student CLS, 2013) • Frank van Alphen (MSc Student CLS, 2013)
11.00	11.15	Break
11.15	11.45	Opleidingscommissie UvA (Ba en Ma) UvA BSc IN en MSc GC/CLS: • Toto van Inge (Voorzitter, BSc IN en MSc GC/CLS FNWI) • Tamara Ockhuijsen (Secretaris, BSc IN en MSc GC/CLS FNWI) • Rein van den Boomgaard (Docentlid, BSc IN, FNWI) • Alfons Hoekstra (Docentlid, MSc GC/CLS, FNWI) • Sammy Odenhoven (Studentlid, BSc IN, FNWI) • Jeroen Hofman (Studentlid, BSc IN, FNWI)
11.45	12.30	Examencommissie en Studieadviseurs UvA (Ba en Ma) UvA BSc IN en MSc GC/CLS: • Inge Bethke (Voorzitter, BSc IN en MSc GC/CLS, FNWI) • Dick van Albada (Lid ExCie, BSc IN en MSc GC/CLS, FNWI) • Richard Kellermann (Studieadviseur, MSc GC/CLS, FNWI)
12.30	14.00	Lunch en open spreekuur
14.00	15.30	Voorbereiden eindgesprek met management
15.30	16.00	Eindgesprek met management VU en UvA (zowel bestuurlijk als inhoudelijk management) VU: • Irth • Vermeer • Van Steen • Fokkink • Schreiber UvA: • Karel Jan Schoutens (Decaan FNWI) • Michel Haring (Directeur Onderwijs FNWI) • Jan Bergstra (Directeur IvI) • Andy Pimentel (Directeur Graduate School of Informatics, FNWI) • Jeroen Goedkoop (Directeur College of Science, FNWI) • Robert Belleman (Opleidingsdirecteur BSc IN, FNWI) • Jaap Kaandorp (Opleidingsdirecteur MSc GC/CLS, FNWI) • Babette Sluijter (Opleidingscoördinator BSc IN, FNWI) • Kristien van Lunen (Opleidingscoördinator MSc GC/CLS, FNWI)
16.00	16.30	Presentatie bevindingen en informele afsluiting

Appendix 7: Theses and documents studied by the committee

Prior to the site visit, the committee studied the theses of the students with the following student numbers:

6108636	6306029	0571768
0583656	0605131	0518476
10033211	0468169	6107575
10033122	10033157	6110282
10058273	10149767	10064966
6200974	6423922	6526268
10158731		

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

- Reglement Faculteit der Natuurwetenschappen, Wiskunde en Informatica (FNWI) UvA
- Beleidsplan Facultaire Studentenraad
- Instellingsplan UvA 2011-2014
- Facultair Jaarverslag 2010, 2011 en 2012
- Jaarverslag en Jaarplan Graduate School of Informatics
- Jaarverslag Facultaire Studentenraad
- Teaching and Examination Regulations Part A and B Master's programme in Computational Science
- Regels en Richtlijnen van de Examencommissie FNWI
- Studiesucces UvA
- Basiskwalificatie onderwijsgevenden FNWI
- Handboek Kwaliteitszorg FNWI
- Handleiding Toetsing FNWI
- NVAO rapport UvA Instellingstoets Kwaliteitzorg - 2013-10-29 Onderwijsvisie UvA
- Evaluatieonderzoeken en enquêtes
- Aanvullend materiaal geselecteerde vakken
- Voorbeelden van werkstukken en verslagen

Appendix 8: Declarations of independence

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nederlands-vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM:
Dhr. Jan Paredaens

PRIVÉ ADRES:
K Karellaan 42
B-1982 ELEWIJT

IS ALS DESKUNDIGE (voorzitter) / ~~SECRETARIS~~ GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Informatica

AANGEVRAAGD DOOR DE INSTELLING:

TU Delft; Open Universiteit; Rijksuniversiteit Groningen; TU Eindhoven; Universiteit Utrecht, Radboud Universiteit, Universiteit Leiden; UvA/VU; Universiteit Twente

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

1

nvao
nederlands - vlaamse accreditatieorganisatie

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

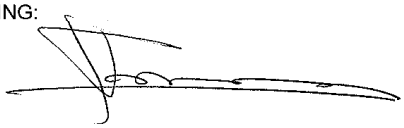
VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Antwerpen

DATUM: 26.4.13

HANDTEKENING:



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ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: A. Bijlsma

PRIVÉ ADRES:

Maasvelderweg 22. 6229 XT Maastricht

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

B Informatica

M Computing Science

AANGEVRAAGD DOOR DE INSTELLING:

RU Groningen

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

1

nvao
nederlands - vlaamse accreditatieorganisatie

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VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Heerlen DATUM: 9-4-'13

HANDTEKENING: 

nvao

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: BART PRENGEL

PRIVÉ ADRES: PRINSES LYDIALAAN 54

B-3001 LEUVEN

BELGIE

IS ALS DESKUNDIGE / ~~SECRETARIS~~ GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

INFORMATICA

AANGEVRAAGD DOOR DE INSTELLING:

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

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VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Leuven

DATUM: 25 juli 2013

HANDTEKENING:

nvao

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Sjouke Mauw

PRIVÉ ADRES:

20, RUE TH. GILLEN
L-1625 HOWALD LUXEMBURG

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

INFORMATICA

AANGEVRAAGD DOOR DE INSTELLING:

VSNU / QANU
RUG, TUE, UU, UvA, VU

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

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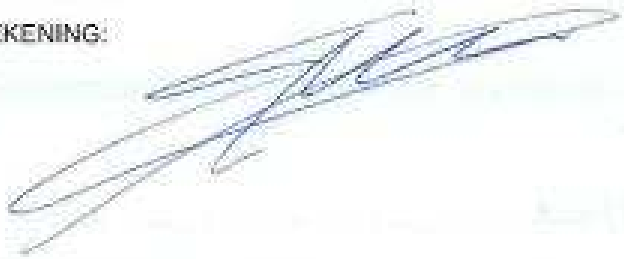
VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Luxemburg DATUM: 3/4/13

HANDTEKENING:



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ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Ruud Valkij (Ruud Verbij)

PRIVÉ ADRES: Borstelweg 40, Enschede

IS ALS DESKUNDIGE / ~~SECRETARIS~~ GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

alle informatica (BSc en MSc) aan:

AANGEVRAAGD DOOR DE INSTELLING:

UVA/VU, OU, TU Delft, UU,

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

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VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

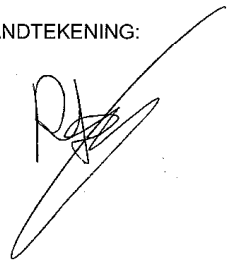
VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Antwerpen.

DATUM: 26-4-13

HANDTEKENING:



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ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: BARBARA VAN BALEN

PRIVÉ ADRES:

KLEINE Houtweg 8 2012 CH
Haarlem

IS ALS ~~DESKUNDIGE~~ / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Informatica

AANGEVRAAGD DOOR DE INSTELLING:

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

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nederlands - vlaamse accreditatieorganisatie

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VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Utrecht DATUM: 26 april 2013

HANDTEKENING: