Computer Science

**Faculty of Mathematics and Natural Sciences,
the University of Groningen**

CONTENTS

This report was finalized on 25 November 2013

Report on the master's programme Computing Science of the University of Groningen

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

Administrative data regarding the programme

Master's programme Computing Science

Name of the programme:	Computing Science
CROHO number:	60346
Level of the programme:	master's
Orientation of the programme:	academic
Number of credits:	120 EC
Specializations or tracks:	Intelligent Systems, Computational Science and Visualisation, Software Engineering and Distributed Systems, Science, Business and Policy
Location(s):	Groningen
Mode(s) of study:	full time
Expiration of accreditation:	31-12-2014

The visit of the assessment committee Computer Science to the Faculty of Mathematics and Natural Sciences of the University of Groningen took place on 5 and 6 September 2013.

Administrative data regarding the institution

Name of the institution:	the University of Groningen
Status of the institution:	publicly funded institution
Result institutional quality assurance assessment:	positive with conditions

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 Computing Science consisted of:

- Prof.dr. J. Paredaens (chairman), retired professor in Database Research, Antwerp University;
- Prof.dr. L. Bijlsma (member), professor Software Construction and Dean of the Faculty Computer Science, Open Universiteit;

- Prof.dr. S. Mauw (member), professor in Security and Trust of Software Systems, University of Luxembourg;
- Prof.dr.ir. W. Van Petegem (member), associate professor and Director Teaching and Learning, KU Leuven;
- P. Boot Bsc (student member), master student Computer Science, Utrecht University.

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

The University of Groningen 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 (see Appendix 8).

Working method of the assessment committee

The assessment of the master's programme Computing Science was part of an assessment cluster. In total, the committee assessed 26 programmes from ten universities: Open Universiteit, 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 10 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 Computer Science, 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.

As well as 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. While the committee had some doubts about the assessment of one of the theses, it decided to select another three theses to study in addition. The committee therefore studied 18 master theses.

Site visit
A preliminary programme of the site visit was made by the coordinator and adapted after consultation of the committee chairman and the programme coordinator of the University of Groningen. The timetable for the visit in Groningen 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 Examiners. 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 material it had requested; an overview of this material is given in Appendix 7. The committee gave students and lecturers the opportunity – outside the set interviews – to speak informally to the committee during a consultation hour. No requests 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 comments received from the programme were discussed with the committee chairman. The final version of the report was sent to the committee members for a final check. Subsequently the definitive report was approved and sent to the University of Groningen.

Decision rules
In accordance with the NVAO's Assessment Framework for Limited Programme Assessments (as of 6 December 2010), 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

The master's degree programme in Computing Science of the University of Groningen is an English-taught two-year programme which offers a research variant and a society variant Each variant offers two specializations:

- Intelligent Systems (Research)
- Computational Science and Visualization (Research)
- Software Engineering and Distributed Systems (Society)
- Science, Business and Policy (Society)

Standard 1
The objective of the master's degree programme in Computing Science is to impart knowledge, skills, understanding and attitude by means of a broadly based curriculum such that master graduates are able to be independent professionals in the field of computing science. 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 committee has established that learning outcomes defined for the master's programme Computing 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 fact that the master's programme not only prepares the students for continuing education in a PhD trajectory but also enables them to fulfil a position on the labour market.

Standard 2
To ensure the coherence in the programme three programme-wide compulsory modules are offered: Web & Cloud Computing (5 EC), Image Processing (5 EC), and Student Colloquium (5 EC). Besides these three compulsory modules, the first year of the programme consists of 30 EC of specialization-specific compulsory modules as well. These modules offer a deepening in the field of the specialization.

At the end of the first year of the programme, the specializations offer an In-Company or Research Internship (15 EC). The Research Internship aims to train students to conduct scientific research in Computing Science at master's level. In the second year the students follow optional courses for specializations (30 EC) and conduct a final-year project.

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 development of academic research and writing skills is adequately addressed. The programme enables the students to develop academic and research skills and prepares them sufficiently for the master's thesis.
The committee established that the programme is feasible and unnecessary study delay for the students is avoided. The committee is very positive about the bridging programme offered to HBO students, which makes it possible for these students to get a master's degree Computing Science.

The quality of the teaching staff is good. The committee was impressed by the dedication of the small staff to the students and the programme. The committee, however, noticed that the

teaching forms used are not very innovative and recommends to make more use of web lectures, interactive teaching forms and new media.

The programme oriented facilities are adequate. The same applies to the programme oriented quality assurance.

Standard 3
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 and discussion with the Board of Examiners responsible for the master's programme. The committee has established that the Faculty puts a lot of effort in the development of a transparent, reliable and valid assessment system. The Board of Examiners fulfils its task with dedication.

The committee has studied a selection of 18 master's theses and established the students achieve the intended learning outcomes of the master's programme.
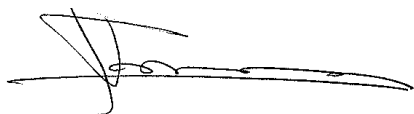
The committee assesses the standards from the Assessment framework for limited programme assessments in the following way:

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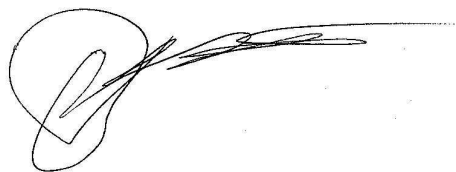
General conclusion   satisfactory

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: 25 November 2013

Prof. dr. J. Paredaens   Dr. B. M. van Balen

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

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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

Profile
As of January 1st 2013, all master's degree programmes and the PhD programme of the Faculty of Mathematics and Natural Sciences (FMNS) are part of the Graduate School. The School is governed by a director and a board. The director delegates certain responsibilities to the deputy-directors of the programmes. The master's degree programme in Computing Science is an English-taught two-year programme which offers a research variant (P-variant) and a society variant (M-variant, M stands for 'Maatschappij', the Dutch word for society). The P-variant (the 'P' stands for 'Promotie' the Dutch word for PhD) prepares for a career in academia or other research institutes, whereas the M-variant aims at the development of understanding and skills to prepare for a career in a company, consultancy or policy organization. Each variant offers two specializations:

- Intelligent Systems (P-variant)
- Computational Science and Visualization (P-variant)
- Software Engineering and Distributed Systems (M-variant)
- Science, Business and Policy (M-variant, the business and policy part is taught in Dutch).

The M-variant Science, Business and Policy is a faculty-wide initiative. It combines one year of computing sciences courses with one year business and policy courses offered by the Science and Society group of the Faculty.

The general objective of the master's degree programme in Computing Science is to impart knowledge, skills, understanding and attitude by means of a broadly based curriculum such that master graduates are able to be independent professionals in the field of computing science. This objective is defined in learning outcomes for the programme. These learning outcomes can be found in Appendix 1.

The domain of research differs for the variants of the programme: the P-variants Intelligent Systems and Computational Science and Visualization focus on research in Computing Science in the strict meaning of the word (i.e. the discipline Computer Science of the ACM/IEEE-report), whereas the M-variant Software Engineering and Distributed Systems focuses on research in the field of Software Engineering, and the M-variant Science, Business and Policy on multidisciplinary research on the border between Computing Science, Business, and Policy.

The committee at first did not understand why so many specializations are offered in the programme, considering the limited size of the staff involved. The programme management however ensured that one of the variants offered (the M-variant Science, Business and Policy) does not require any additional effort from the Computing Science staff, because this variant is a Faculty wide initiative. The other variants are closely connected to the research done by the staff and have a lot of courses in common. The students mentioned that the variants give them the opportunity to follow a master programme according to their interests. The variants form a coherent, attractive and differentiated package.

Level and orientation
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 committee has verified that the intended learning outcomes are in line with the domain specific requirements. The learning outcomes indicate sufficiently that the programme is aiming at a master's degree level.

Considerations

The committee has established that learning outcomes defined for the master's programme Computing 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 that the master's programme not only prepares the students for continuing education in a PhD trajectory but also enables them to fulfil a position on the labour market.

The committee is positive about the orientation of the master's programme as indicated in the variants offered.

Conclusion

Master's programme Computing Science: the committee assesses Standard 1 as **satisfactory**.

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 Computing Science, 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, the intake and the study load, the teaching staff and the facilities are discussed.

Programme and coherence of the curriculum
The programme offers four specializations, which on the one hand provide students with the opportunity to gain specialist knowledge in a specific field, and on the other hand globally divide their future field of work:

- Intelligent Systems (IS)
- Computational Science and Visualisation (CSV)
- Software Engineering and Distributed Systems (SEDS)
- Science, Business and Policy (SBP)

Students choose one of these specializations right from the start of the master's degree programme.

General outline of the IS, CSV and SEDS specializations
The general outline of the IS, CSV and SEDS specializations is as follows

Module	EC
Web & Cloud Computing	5
Image Processing	5
Student Colloquium	5
Compulsory modules of specialization	30
Optional modules of specialization	30
In-company or Research Internship	15
Final-year Project	30
Total	120

To ensure the coherence in the programme three programme-wide compulsory modules are offered: Web & Cloud Computing, Image Processing, and Student Colloquium. Besides these three compulsory modules, the first year of the programme consists of 30 EC of specialization-specific compulsory modules as well. These modules offer a deepening in the field of the specialization.

At the end of the first year of the programme, the specializations offer a Research Internship (15 EC). The Research Internship aims to train students to conduct scientific research in

Computing Science at master's level. During the period students will learn several research skills: analyzing scientific problems, literature study, solving a problem or the simplification of a problem, implementing solutions, drawing conclusions, writing a scientific report, oral presentation of the results, becoming familiar with and discussing research by others, and using adequate tools. The specialization SEDS offers besides a Research Internship also the possibility of an In-Company Placement. In the second year the student chooses optional modules and finishes the programme with the Final-year Project (30 EC). Each specialization offers a list of optional modules.

The committee discussed the programme with teachers and with students and concludes that the specializations offer the students an attractive coherent programme in line with their interests. The programme enables the students to develop their research skills.

The decision of the programme to make the courses Web & Cloud Computing and Image Processing compulsory for all master's students is somewhat surprising to the committee. The teachers and students however could convince the committee that the content of these courses is useful for all students irrespective of their specialization.

The committee verified that the development of academic research and writing skills is adequately addressed within the programme. Two courses train the students in academic and research skills. The first course is the Student Colloquium (5 EC). This has the form of a scientific conference. The module starts with a number of tutorials on reporting in both oral and written form. Subsequently, the students write in pairs a conference contribution based on a number of connected papers proposed by a member of staff. Students and members of staff play the roles of the programme committee and referees (peer review). During the conference the contributions are presented to an audience of fellow students and members of staff. Accepted contributions are published in the proceedings of the conference.

The second course is the Research Internship (15 EC), which is offered at the end of the first year of the programme by the specializations. The Research Internship aims to train students to conduct scientific research in Computing Science at master's level. During the period students will learn several research skills: analyzing scientific problems, literature study, solving a problem or the simplification of a problem, implementing solutions, drawing conclusions, writing a scientific report, oral presentation of the results, becoming familiar with and discussing research by others, and using adequate tools.

The committee discussed the programme with the students and teachers and is convinced that the master's programme Computing Science is well structured and coherent. The programme enables the students to develop academic and research skills and prepares them sufficiently for the master's thesis.

Intake and study load and study guidance
Data on intake and progress in the master's programme are presented in Appendix 5. It should be noted that until recently students could start with their master's programme without finishing their bachelor's. These students are registered as master's students on the date they received their bachelor's. The progress data therefore look better than they really are. The majority of the students enter the programme with a bachelor degree *Informatica* (Computer Science) of the University of Groningen. HBO graduates and international students form a substantial part of the intake. Remarkably no students with a bachelor's degree from other Dutch universities entered the master's programme.

HBO students can enter the master programme after finishing a bridging (*schakel*) programme. The committee met a few students who followed this trajectory. These students were very positive about the bridging programme. They mentioned that they were very well informed about the requirements for entering the master's programme and that they feel very well guided. The bridging programme provided them with the knowledge and skills required to follow the master's programme. The bridging programme is tailored for students from the neighbouring Hanze Hogeschool, but also students from other HBO institutes felt that they were very well supported and that individual adjustments in the programme are possible.

The year is divided into two semesters, which each are divided into two periods, each period consisting of seven or eight weeks of lectures followed by two or three weeks of examinations. Except for the research project, the study load of the modules is 5 EC. In each period students can enrol in three such modules, which are taught in parallel. Students have the possibility to sit an examination twice a year: the exam at the end of the period in which the module is taught and the re-sit at the end of the next period. Assignments are due at the end of the period. An examination for a practical is given once a year.

There are in general no entry requirements to individual modules. However, to assure a sufficiently high level in knowledge and skills, students are only allowed to start with the In-company or Research Internship after having passed at least 30 EC of the master's degree programme. The Final-Year project does not have an official entry requirement, but at the start of the project the supervisor makes sure that the student is not missing more than just a few modules. The protocol for the Final-Year project guarantees a timely signalling of the progress of the project; halfway through the planned period for the project the supervisors of the project and the student meet to discuss the progress and make adjustment if necessary.

The students the committee met during the site visit did not report any obstacles in the programme. The study load is according to these students feasible. They think it is possible to graduate in two years. In case a student experiences factors hindering the study progress, this is first discussed with the study advisor. During the In-company or Research Internship and the Final-Year project the supervisor is the first contact person in case of delay.

The committee established that the master's programme is feasible and the programme management is taking sufficient actions to avoid unnecessary study delay for the students. The committee is very positive about the bridging programme offered to HBO students, which makes it possible for these students to get a master's degree Computing Science.

Teaching staff
The master's programme Computing Science is taught by a small teaching staff of ten persons. The committee is very positive about the efforts of the involved staff to offer a good curriculum which prepares the students to achieve the intended learning outcomes. The students reported during the site visit that the teachers are easily accessible and committed to the programme. This is very much appreciated. The small size of the teaching staff could, according to the committee, in short term lead to problems, considering the growing student numbers. The committee recommends to develop a recruitment strategy for the coming five or ten years.

The committee has received information about the didactical trainings the teachers receive (*Basiskwalificatie Onderwijs, BKO*) and learned that within due time all staff will be trained and certified. Next to this compulsory trajectory towards the BKO certificate, teachers are also encouraged to follow trainings and courses for higher qualifications and professionalising in

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teaching skills. The Faculty is developing plans for a career path in teaching excellence. The committee is of the opinion that this a very positive development.

Both the bachelor's and the master's programme is taught in English. Proficiency in English is therefore required for all teaching staff. Only incidentally the English proficiency of a teacher is noticed as a problem by the students. In these cases the management immediately takes action. The university offers a broad range of trainings in academic English for both teachers and students.

The committee noticed that the teaching forms used are not very innovative. The committee recommends to make more use of web lectures, interactive teaching forms and new media.

Facilities
While touring the facilities during the site visit, the committee obtained a good idea of the teaching facilities in the building. The lecture and instruction rooms seem modern and adequate. The recent growing inflow of students however needs some attention. There could become a shortage of working space. The committee learned that the Faculty is already working on this aspect.

Programme oriented quality assurance
The committee met student and teacher members of the programme committee. This committee has a central place in the quality assurance for the degree programmes. All courses are evaluated by a questionnaire students have to fill out after the course exam. The programme committee receives all results. The evaluation of the course is graded by the programme committee. For all courses with low grades an improvement plan has to be developed by the teacher concerned. The programme committee meets five times a year. The committee is very positive about the way the programme committee is functioning.

The Advice Board (Raad van Advies) provides contacts with the field. The committee appreciates this Advice Board and the efforts taken to discuss the programme and new developments with field experts. The contacts with alumni, however, can be strengthened. The committee is of the opinion that better use could be made of the input of alumni. It understood that an alumni association is in statu nascendi.

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 programme enables the students to develop academic and research skills and prepares them sufficiently for the master's thesis. The committee established that the programme is feasible and unnecessary study delay for the students is avoided. The committee is very positive about the bridging programme offered to HBO students, which makes it possible for these students to get a master's degree Computing Science.

The quality of the teaching staff is good. The committee was impressed by the dedication of the small staff to the students and the programme. The committee, however, noticed that the teaching forms used are not very innovative and recommends to make more use of web lectures, interactive teaching forms and new media.

The programme oriented facilities are adequate. The same applies to the programme oriented quality assurance.

The commission considers this master programme to be satisfactory since it did not detect many points of amelioration, neither did it detect many topics that can be graded above the general mean of the Dutch masters programmes.

Conclusion

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

Findings

This section deals with the assessment system and the level achieved by the graduates of the master's programme Computing Science of the University of Groningen. 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 and discussion with the Board of Examiners responsible for the master's programme.

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

Assessment system
The Board of the Faculty has developed an assessment policy which addresses the design of tests, the testing and assessment procedures, and the method of regular evaluation. The general starting points for the testing and assessment system are:

- testing is an integrated part of the programme,
- the method of testing is derived from (and closely related to) the learning objectives,
- each test aims to maximize its transparency, representativeness, validity and reliability,
- students are informed.

The examiner is responsible for transparent, representative, valid and reliable testing. The method of assessing a module is related to the learning objectives and the teaching method of the module. The content which is assessed is determined by the learning outcomes of the programme and the learning objective of the module.

In order to achieve more transparency and consistency in the assessment system the following measures are taken as of the academic year 2012-2013:

- a second examiner is appointed to each module unit
- the first examiner provides the Board of Examiners with the assessment material (i.e. the written examination and/or assignments and the grading scheme together with an assessment form).

The first examiner specifies on the assessment form the learning objectives of the module unit, the assessment method, the way the final grade is computed, and the relation between the assessment method and the learning objectives of the module unit. The second examiner specifies on the form whether the assessment material is clear and correct, evaluates whether

the assessment covers the module material and objectives representatively and sufficiently, and if necessary provides suggestions for improvements.

The Research Internship is conducted under the supervision of a staff member of the department Computing Science. A protocol is not yet available for this Internship. The programme will develop a protocol (based on the protocol of the Final-year Project) which will be in place in 2013-2014. The In-Company Placements of the specialization SEDS are coordinated by a staff member of the department. At the start of the placement the student writes, in consultation with the external supervisor, a proposal which needs to be approved by the coordinator. After the placement is finished the external supervisor writes a short evaluation of the student's performance. The coordinator discusses this evaluation with the student, and gives the final grade.

In order to achieve a transparent and consistent supervision and assessment of the Final-year Project a protocol is in place:

- two supervisors are involved in supervising and grading each project ,
- the monitoring of the project is documented by the use of forms at the start, halfway, and at the end of the project.

The first (main) supervisor of the project is a scientific staff member in the field of Computing Science. In order to assure a consistent and unbiased assessment of the project the second supervisor belongs to a different research unit than the one in which the student performs the Final-year Project. In case of projects conducted in collaboration with external parties (e.g. other academic institutions or companies) a third supervisor from this party will be involved. The Final-year Project is assessed on the basis of the entire project, including the thesis and oral presentation, and the assessment is laid down using a form.

The committee concluded on basis of the information provided by the Faculty and the interviews during the site visit that the Faculty puts a lot of effort in developing a valid, reliable and transparent assessment system. The Board of Examiners fulfils its tasks in a responsible and dedicated way. The committee has studied a selection of theses and has spoken with several panels about the assessment of the theses. In many aspects the assessment of the theses is, thanks to the explication of the regulations, transparent. However, it was not clear to the committee how the grading of the theses is tuned. It was unclear why some theses got lower or higher grades than others. The committee recommends to define criteria for the grading.

Achieved learning outcomes
The committee has studied 18 master theses. A first selection contained 15 master theses and during the site visit the committee studied 3 theses in addition to get a complete idea about the level the students achieved in the master's programme and about the differences in assessing and grading between the theses. Although the committee would have graded some of the theses lower than the examiners, it is of the opinion that all theses show that the students have achieved the intended learning outcomes of the master's programme. All master theses have an adequate academic level.

This conclusion is supported by the opinion of the alumni and the representatives of the professional field. In the interviews during the site visit these panels stated that the master's programme prepares the students for a position in the labour market on an academic level.

The graduates easily find a job on master's level in their field and the labour market is very satisfied with their qualifications.

Considerations

The committee has established that the Faculty puts a lot of effort in the development of a transparent, reliable and valid assessment system making use of 'examination assessment forms' and 'peer reviews'. The Board of Examiners fulfils its tasks with dedication. One aspect still needs some attention: to achieve more uniformity in grading, criteria should be developed for the grading of theses.

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

Conclusion

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

General conclusion

The committee concluded that the master's programme Computing Science of the University of Groningen 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 Computing 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 specialization 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. W. (Wim) Van Petegem is a university professor at the KU Leuven and is also Director of Teaching and Learning. He completed his degree as a civil engineer at the University of Ghent and was awarded his doctorate in 1993 from the KU Leuven. He has worked at the University of Alberta, Edmonton (Canada), the Open University (The Netherlands), Groep T and the KHLeuven (Belgium). He teaches courses on multimedia production and the development of teaching materials (multimedia). His research interests encompass multimedia production, new teaching technology, networked e-learning, virtual mobility, lifelong learning, open and distance education, knowledge transfer and scientific communication. In his specialist field he is involved in numerous international research, development and implementation projects as investigator, coordinator, partner or expert, and he is on the board of various international networks. Given his expertise he has already been a committee member for review committees, in Flanders, the Netherlands and further afield.

Prof. dr. Lex Bijlsma (1949) is professor Education and Softwareconstruction and vice-dean of the Faculty Management, Science and Computer Science, 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. Sjouke Mauw is professor in Security and Trust of Software Systems at the University of Luxembourg since 2007. He studies mathematics at the University of Amsterdam and did a PhD in Computer Science at the same university. He was assistant professor at the University of Amsterdam (1988) and Eindhoven University of Technology (1992). In 1999 he became associate professor in Eindhoven. As a researcher he was also related to the CWI in Amsterdam. Sjouke Mauw is principal investigator of a research group focussing in formal methods in the areas of security en trust. He has also published on several other subjects like proces algebra, domain specific languages, testing, distributed algoritmes and bio-informatics.

Peter Boot is master student "Game and Media Technology" at Utrecht University. He did his bachelor's in Computer Science at the same university. He participated in several committees within the university. He was member of the board of the study association A-Eskwadraat in 2011-2012, student member of the Faculty Council of the Science Faculty in 2012-2013 and board member of the Bètadag Foundation.

Appendix 2: Domain-specific framework of reference

Master's programme

1.1 Learning outcomes in general
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 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.

1.2 Domain specific contents, the nature of Master degree courses
The Master's degree course 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 course will generally concentrate on subjects in a limited Specialisation within the field, or in the border region with adjacent fields. If the course 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 courses have identified a (international) community of courses of a similar nature and they will fit the standards of that community.

The Master's degree course 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 course and research activities, and researchers are active as lecturers and supervisors in the degree course. 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 course there will be a final project that takes at least one quarter of the entire course. 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).

1.3 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 course 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 course 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 courses to have sufficient contacts within trade and industry.

Appendix 3: Intended learning outcomes

The objective of the master's degree programme in Computing Science is to impart knowledge, skills, understanding and attitude by means of a broadly based curriculum such that master graduates are able to be independent professionals in the field of computing science. This objective has led to the following learning outcomes for the programme.

Learning outcomes of the master's degree programme in Computing Science

The Master graduate in Computing Science
G1. has specialized knowledge of theories, methods and techniques in one of the following subfields of Computing Science:
- Intelligent Systems
- Software Engineering and Distributed Systems
- Computational Science and Visualization

G2. is able, by using scientific data and assessments, to analyze problems in Computing Science or a related scientific field of study, to provide specified solutions to the problem, and – if possible – to materialize these solutions (in the shape of an algorithm or program or an implementation in software or hardware);

G3. is sensitive to the social and ethical aspects of complex Computing Science applications and his/her own responsibilities therein;

G4. is able to critically read professional literature and to assess its correctness, usability and relevance;

G5. has a proper understanding of the scientific relevance of problem definitions and results, and of the validity of the scientific method used.

G6. is capable of clear communication (both oral and in writing) on conclusions and the knowledge and rationale underpinning these, in the field of Computing Science and its applications;

G7. is capable of working in a team and in various projects in both professional and scientific contexts;

G8. is able to autonomously keep up with new developments in Computing Science.

Each specialization of the master's degree programme Computing Science has additional learning outcomes:

The Master in Computing Science graduated in the subfield of Intelligent Systems or Computational Science and Visualisation
P1. is able to contribute to the enhancement of scientific understanding in a subfield o Computing Science.

The Master in Computing Science graduated in the subfield of Software Engineering and Distributed Systems (SEDS)
M1. is capable of systematically designing and implementing software systems in cooperation with interested parties;
M2. is capable of integrating existing and new software components into a system that meets the quality criteria that were agreed upon.

The Master in Computing Science graduated in the subfield of Science, Business and Policy (SBP)

M3.   has a full understanding of the way in which businesses and policy organisations are functioning (governments and nongovernmental organisations, NGO's);
M4.   understands the connections between natural science research, trade and industry and governmental policies;
M5.   is able to integrate aspects of natural science, business and management;
M6.   is able to translate a concrete problem definition in business or management into a natural science problem definition;
M7.   is able to connect problem aspects of natural sciences to other relevant subject fields;
M8.   is able to put research data and conclusions into a business or policy context;
M9.   has developed his/her social and communicative skills:
M10.   is able to write texts that are effective and to the point;
M11.   is able to draw up an innovation plan or management plan for either a business or a government organisation;
M12.   is able to give convincing oral presentation;
M13.   is able to deliver an active contribution to plenary discussions;
M14.   is familiar with techniques used in business meetings and is capable of chairing a meeting;
M15.   is able to work on a project as part of a team;
M16.   is able to give and receive feedback concerning his/her way of functioning in a team;
M17.   can work in a project;
M18.   is able to fully consider the interests or objectives of the ordering customer;
M19.   is able to plan a project independently;
M20.   is able to cooperate with the relevant parties involved in the project;
M21.   is able to adequately deal with limitations in time, information and means;
M22.   is able to prepare the implementation of a project result;
M23.   is capable of taking professional responsibility;
M24.   is able to take responsibility on behalf of the organisation;
M25.   is able to recognize the strategic aspects of his/her own project;
M26.   is able to provide practical solutions in matters concerning the ethical and professional codes of his/her own field of expertise and of the professional organisation.

Appendix 4: Overview of the curriculum

The programme offers four specializations, which on the one hand provide students with the opportunity to gain specialist knowledge in a specific field, and on the other hand globally divide their future field of work:

- Intelligent Systems (IS)
- Computational Science and Visualisation (CSV)
- Software Engineering and Distributed Systems (SEDS)
- Science, Business and Policy (SBP)

Students choose one of these specializations right from the start of the master's degree programme.

General outline of the IS, CSV and SEDS specializations
The general outline of the IS, CSV and SEDS specializations is as follows

Module	ECTS
Web & Cloud Computing	5
Image Processing	5
Student Colloquium	5
Compulsory modules of specialization	30
Optional modules of specialization	30
In-company or Research Internship	15
Final-year Project	30
Total	120

General outline of the Science, Business and Policy specialization (SBP)
The first year of the SBP specialization consists of a deepening of the students' knowledge of computing science (via compulsory and optional modules and an In-company or Research Internship). The final year includes the Science in Policy & Management module and the final-year placement project.

Module	ECTS
Web & Cloud Computing	5
Image Processing	5
Student Colloquium	5
Optional Modules	30
In-company or Research Internship in Computing Science	15
Science in Policy & Management module	20
Policy & Management final-year placement project	40
Total	120

Appendix 5: Quantitative data regarding the programme

Data on intake, transfers and graduates

Total number of students

Year	Number of students enrolled	Male	Female
2008-2009	55	53	2
2009-2010	66	62	4
2010-2011	62	57	5
2011-2012	82	78	4

Intake in the programme

Cohort	Total	Male	Female	BSc RUG	BSc in NL	HBO	International
2008-2009	(27)	(26)	(1)	(25)	(0)	(0)	(2)
2009-2010	29 (29)	26 (26)	3 (3)	19 (22)	0 (0)	5 (2)	5 (5)
2010-2011	37 (37)	35 (35)	2 (2)	14 (21)	0 (0)	16 (9)	7 (7)
2011-2012	27	25	2	10	0	8	9

VSNU data within brackets

Number of graduates and duration of study in months

Graduation Year	Total number graduates	BSc RUG			Bsc in NL		HBO		International	
		#	months MSc	months BSc+MSc	#	months MSc	#	months MSc	#	months MSc
2008-2009	15	14	20	88					1	35
2009-2010	28	25	23	67			1	62	2	33
2010-2011	21	15	29	82			1	81	5	32

Output of the programme (cumulative percentage of graduated students)

Cohort	Within 2 years	Within 3 years	Within 4 years	Drop-outs
2008-2009	44%	67%	78%	15%
2009-2010	35%	66%	73%	14%
2010-2011	22%	35%*		5%*
2011-2012	4%*			4% *

Teacher-student ratio achieved

Academic year	fte teaching	number of students registered at October 1	number of degrees granted	number of students per fte education	number of granted degrees per fte education
2011-2012	4.4	82	19	18.7	4.3

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

Year	Lectures	Tutorials	Practicals	Research	Self study	Total
1	195		82	420	1083	1680
2	148		68	840	624	1680

Appendix 6: Programme of the site visit

5 September		
12.00	15.00	Voorbereidend overleg van de commissie + inzage documenten
15.00	16.00	**Management** Prof.dr. Theo Elzenga, directeur Undergraduate School of Science Prof.dr. Gerard Renardel de Lavalette, adjunct-opleidingsdirecteur Informatica/ Computing Science Prof.dr.Nicolai Petkov, voorzitter Curriculumcommissie Prof.dr. Jos Roerdink, trekker track Biomedical Computing Prof.dr. Paris Avgeriou, trekker track Business Computing, Dr. Han van der Strate, coördinator Informatica/ Computing Science & Honours College
16.00	17.00	**Studenten** Jelle Bakker, bachelorstudent 2012 Rayan Brouwer, bachelorstudent 2012 Jürgen Visser, bachelorstudent 2011 Tycho Marinus, bachelorstudent 2010 Arjen Zijlstra, bachelorstudent 2010 Dirk Nederveen, masterstudent 2009 Frank Blaauw, masterstudent 2012 Christiaan Manteuffel, masterstudent 2011
17.00	17.30	**Alumni** Dr. Rix Groenboom Dr. Josien Pluim Drs. Jan Salvador van der Ven Drs. Ando Emerencia Dr. Arnold Meijster Drs. Allard Naber
17.30	18.00	**Internoverleg commissie**
19.30		**Diner** (alleen commissie)

6 September		
9.00	10.00	**Docenten** Dr. Henk Bekker Dr. Michael Wilkinson Dr. Alexander Lazovik Dr. Arnold Meijster Prof.dr. Jos Roerdink Dr. Rein Smedinga
10.00	10.30	**OLC (studenten en docenten)** Prof.dr. Marco Aiello, voorzitter Guus Klinkenberg, bachelorstudentengeleding, vicevoorzitter Dr. Michael Wilkinson, docentengeleding Sophie Hugenholtz, bachelorstudentengeleding David Otterbein, masterstudentengeleding
10.30	11.15	**Examencie en studieadviseur** Prof.dr. Alex Telea, voorzitter Prof.dr. Michael Biehl, lid

		Drs. Jan Jongejan, lid Dr. Jan van Maanen, lid Dr. Han van der Strate, ambtelijke secretaris Drs. Hanneke Niessink, studieadviseur
11.15	11.45	**Open spreekuur**
11.45	13.00	**Lunch en voorbereiden eindgesprek**
13.00	13.45	**Eindgesprek met management** Prof.dr. Jasper Knoester, decaan Prof.dr. Peter van Haastert, vicedecaan, portefeuillehouder onderwijs Prof.dr. Theo Elzenga, directeur Undergraduate School of Science Prof.dr. Gerard Renardel de Lavalette, adjunct-opleidingsdirecteur Informatica/Computing Science
13.45	15.30	**Opstellen bevindingen**
15.30	16.00	**Mondelinge rapportage**

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:

1411446	1541099	1351214
1398318	1277073	1650130
1623389	1449931	1526855
1408909	1483617	1339184
2009838	2037440	1339095
1634518	1934112	1922017

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):

- Standard / basic books
- Tests, assessment criteria, assessment forms and answers
- Minutes of the Board of Examiners 2011
- Minutes of het Educational committee 2009 – 2011
- Course evaluations

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

(voorzitter)
IS ALS DESKUNDIGE / ~~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

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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:

2

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nederlands - vlaamse accreditatieorganisatie

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

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

PLAATS: Heerlen   DATUM: 9-4-'13

HANDTEKENING:

2

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ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: WIM VAN PETEGEM

PRIVÉ ADRES: FAZANTENLAAN 1
B-3010 KESSEL-LO
BELGIE

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

INFORMATICA

AANGEVRAAGD DOOR DE INSTELLING:

TU Delft, RUG, TU/e, Radboud en UTwente

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

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

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

PLAATS: *LEUVEN*   DATUM: *29/3/2013*

HANDTEKENING:

2

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, TU6, 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;

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.

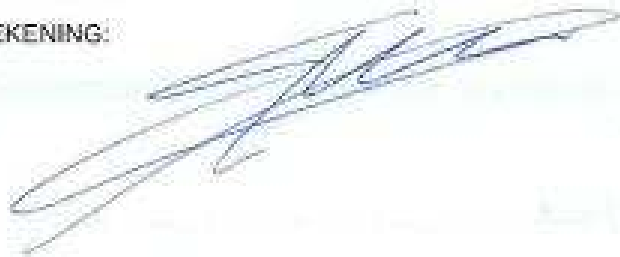VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: _Luxemburg_   DATUM: _3/4/13_

HANDTEKENING:

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ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM:
Dhr. Peter Boot

PRIVÉ ADRES:

Warande 82

3705 ZG Zeist

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

Informatica

AANGEVRAAGD DOOR DE INSTELLING:

Rijksuniversiteit Groningen ; TU Eindhoven; Radboud Universiteit ;

Universiteit Leiden; 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;

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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: DATUM:

Antwerpen   26-4-2013

HANDTEKENING:

2

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

PLAATS: *Utrecht*   DATUM: *26 april 2013*

HANDTEKENING:

2