Physics and Astronomy

Department of Applied Physics,
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CONTENTS

This report was finalized on 19 March 2014.

Report on the master's programme Applied Physics of Eindhoven University of Technology

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

Administrative data regarding the programme

Master's programme Applied Physics

Name of the programme:	Applied Physics
CROHO number:	60436
Level of the programme:	master's
Orientation of the programme:	academic
Number of credits:	120 EC
Specializations or tracks:	Functional (Nano) Materials / Nano Science and Technology, Plasma Physics and Radiation Technology, Physics of Transport in Fluids, Science and Technology of Nuclear Fusion
Location(s):	Eindhoven
Mode(s) of study:	full time
Expiration of accreditation:	31-12-2014

The visit of the assessment committee Physics and Astronomy to the Department of Applied Physics of Eindhoven University of Technology took place on 14 & 15 January 2014.

Administrative data regarding the institution

Name of the institution:	Eindhoven University of Technology
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 Applied Physics at Eindhoven University of Technology consisted of:

- Prof. dr. Martin Goedhart, professor of Mathematics and Science Education and director of education of master Education and Communication in Mathematics and Natural Sciences, University of Groningen;
- Prof. dr. Wim de Boer, professor of Physics of the University of Karlsruhe (DE);

- Prof. dr. ir. Guido van Oost; full professor Plasma Physics, Department of Applied Physics at Ghent University (BE);
- Dr. Jan Hoogenraad, owner of Spoorgloren BV for change management and quantitative service in public transport;
- Lisanne Coenen BSc, master student Applied Physics at Delft University of Technology.

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

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 Applied Physics of Eindhoven University of Technology is part of a cluster assessment. In the context of this cluster visitation, in the time period between November 2013 and April 2014, twenty eight programmes at nine different institutions were assessed.

Appendix 2 contains the framework of reference.

The committee Physics and Astronomy is composed of in total sixteen members:

- Prof. dr. Daan Lenstra, professor emeritus of Electrical Engineering of Delft University of Technology and fellow of Eindhoven University of Technology (chair);
- Prof. dr. Wim de Boer, professor of Physics of the University of Karlsruhe (DE);
- Prof. dr. Elias Brinks, professor of Astrophysics of the University of Hertfordshire (UK);
- Prof. dr. Tom Theuns, reader in Astrophysics of Durham University (UK) and part time professor Astrophysics of the University of Antwerp (BE);
- Prof. dr. Gustaaf Borghs, professor emeritus of Physics at KU Leuven (BE) and senior fellow of the Interuniversity MicroElectronics Centre (IMEC);
- Dr. ir. Jaap Flokstra, professor emeritus and head of education of Nanotechnology, University of Twente;
- Prof. dr. ir. Guido van Oost; full professor Plasma Physics, Department of Applied Physics at Ghent University (BE);
- Dr. ir. Henk Blok, professor emeritus, Faculty of Exact Sciences, VU University Amsterdam;
- Prof. dr. Martin Goedhart, professor Didactics of Math and Natural Sciences and head of education of master Education and Communication in Math and Natural Sciences, University of Groningen;
- Christianne Vink MSc, didactic coach, educational advisor/trainer and partner of Academic Factory;
- Dr. Jan Hoogenraad, owner of Spoorgloren BV for change management and quantitative service in public transport;
- Dr. ir. Harald Tepper, chief strategy officer at the Dutch Forensic Institute;
- Sander Breur MSc, PhD at the Nikhef, University of Amsterdam;
- Lisanne Coenen BSc, master student Applied Physics at Delft University of Technology;
- Carmen van Schoubroeck, student bachelor Math and bachelor Physics and Astronomy, Radboud University Nijmegen;
- Jelmer Wagenaar MSc, PhD candidate in Physics at Leiden University.

Preparation
The committee held a preliminary meeting on October 8, 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 Physics and Astronomy was set.

To prepare the contents of the site visits, the coordinator first checked the quality and completeness of the Critical Reflections 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.

As well as the Critical Reflection, the committee members read a selection of fifteen master theses. The theses were randomly chosen from a list of graduates of the last two completed academic years within a range of grades.

Site visit
A preliminary programme of the site visit was made by the coordinator and adapted after consultation of the coordinator of Eindhoven University of Technology. The time table for the visit in Eindhoven is included as Appendix 6.

Prior to the site visit, the committee asked the programmes to select representative interview partners. Due to unforeseen circumstances, dr. Jan Hoogenraad was absent during the site visit. Hoogenraad did share his insights and questions with the committee before the site visit, and afterwards commented on the draft report. During the site visit, meetings were held with panels representing the faculty management, the programme management, alumni, the educational 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 secretary 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 Faculty 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 Eindhoven University of Technology.

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
In the master's programme in Applied Physics of the Department of Applied Physics (AP) at Eindhoven University of Technology (TU/e), basic disciplinary knowledge gained in a bachelor's programme is enhanced and extended with advanced knowledge in a chosen field of specialization. The four main tracks of the programme (Functional (Nano) Materials/Nano Science and Technology, Plasma Physics and Radiation Technology, Physics of Transport in Fluids, and Science and Technology of Nuclear Fusion) allow the students to develop disciplinary competences in the majority of areas included in the Domain Specific Framework. The committee is positive about the fact that the programme management has started to redesign the master's programme to adapt to the recent changes in the bachelor's programme. This will lead to a more diverse inflow into the master's programme in 2015 and provides an opportunity to achieve more diversity in the output profile of the graduates. The committee values the fact that the main tracks of the programme are so closely connected to the research groups in the department, which allows students to participate in the existing research, get a thorough training in research skills and competences, and to develop advanced disciplinary competences in the majority of areas described in the reference framework.

The intended learning outcomes of the master's programme are geared toward starting a PhD-trajectory and positions in R&D departments of High-Tech Companies. The committee is of the opinion that they are in line with the domain specific requirements and meet international standards. It advises, however, to specify them in relation to the domain of the programme, in order to provide more focus for the design of the programme and the courses.

Standard 2
The master's programme (total 120 EC) has the following structure: a general compulsory module (10 EC), a track-specific compulsory/elective module (17 EC), an elective module (14 EC), an (external/industrial) internship (19 EC) and a final graduation project (60 EC). The programme is devised to facilitate the intake of students at two different moments during the year. The master's programme is intended to train students to be independent researchers and designers. Interaction amongst students and lecturers is strong and professional. A significant part of the programme is the final graduation project, which can be carried out in one of the research groups or outside the department, provided that the project is related to one of the research areas mentioned above and closely (co)supervised by a staff member of the department. The committee was impressed by the number of students that go abroad for their internship. They are stimulated and supported to do so. Students of the master's programme are mainly prepared for continuing in research and less so for training in design. The committee recommends paying more attention to context, design and general academic and communication skills in the master's programme, for instance by stimulating industrial internships.

Contrasting the high number of outgoing students, few students from abroad take the master's programme. The committee recommends to try to attract more foreign students, because a more diverse student population is beneficiary for the quality of interaction between students. With an average of 31 months, the study duration is too high. However, students attribute this to the duration of the internship or graduation project, which they often want to finish with a positive result. Students and teachers expect that the average study duration in the master's programme will decrease.

The programme has a favourable student staff ratio. The teaching staff has the disciplinary expertise to teach the master's programme. Also, they seem enthusiastic and intensively involved. The TU/e has a policy for acquiring a BKO (Basic Teaching Qualification Certificate) for the staff; as of now 50% of the teaching staff has a BKO. However, the committee is of the opinion that the department started relatively late with this and recommends to continue paying attention to teacher professionalizing.

The committee is of the opinion that the educational committee (OCN) proactively performs its tasks in evaluation of courses and quality assurance. They gather a lot of evaluation results, which generally lead to improvement measures. The committee was impressed by the positive involvement and contribution of the student members of the OCN.

Standard 3

The courses in the general compulsory module, the track specific compulsory courses and the elective courses are assessed through the use of various methods, such as written or oral exams, written papers or written assignments. At the end of an external/internal traineeship, the student has to write a report and give a presentation. A final grade for the traineeship is then determined in close consultation with the external supervisor, also taking into account the student's performance during the traineeship. The final graduation project is assessed on a final thesis, an oral presentation, an interview and an oral examination during which the student has to defend his project before the assessment committee, and the student's performance during the execution of the project. The assessment committee consists of the final graduation project supervisor, the daily project supervisor, at least one other member of the research group, and at least one member from one of the other research groups. The committee was impressed by the assessment procedure, which can be considered a best practice. It guarantees involvement of the internal and external examiners and optimizes objectivity, validity and reliability of the final assessment. Since 2010, the assurance of quality and reliability is the responsibility of the Board of Exams (BoE) for Applied Physics. The committee noticed that the implementation of their new responsibilities is not completed yet and that the BoE not yet fully knows the ins and outs of all its tasks, like fraud policy, plagiarism control and the number of cum laude graduates. The committee advises the BoE to take up its new tasks and to proactive control the quality of exams and tests. The committee regards the addition of a testing expert to the BoE as positive.

The committee is of the opinion that the quality of the master's theses is good and, in general, agrees with the marks assigned. However, the way the final grade was assigned was not yet transparent for all theses. The committee advises to document this and to make sure that the assessment forms are filled in and archived. According to alumni, the master's programme perfectly prepares students for a research position. However, they reported that for other jobs, both in university and in industry, they lacked general skills and experiences. The committee advises to pay more attention to context and general skills in the master's programme.

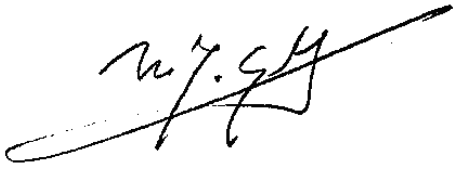
The committee assesses the standards from the Assessment framework for limited programme assessments in the following way:

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: 19 March 2014



Prof. dr. M.J. Goedhart

Dr. B.M. van Balen

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

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 with regard to the Domain Specific Framework of Reference and intended learning outcomes, the level and orientation of the master's programme is described. After considering the findings, the committee comes to a conclusion on Standard 1.

Profile
According to the critical reflection, the master's programme in Applied Physics of the Department of Applied Physics (AP) at Eindhoven University of Technology (TU/e) enables the students to obtain a modern, strongly research-oriented education in Applied Physics. Building on the foundation of a suitable bachelor's degree programme in (Applied) Physics, either from the TU/e or from elsewhere, basic disciplinary knowledge is enhanced and extended with advanced knowledge in a chosen field of specialization. An external traineeship guarantees international and/or industrial experience, and a full year high-level research project emphasizes independent research skills.

The Analysis made by the Project Group ACQA is (see appendix 2) is used by the programme as a framework for establishing the final qualifications and required competences for master's students .

The four main tracks of the Eindhoven programme (Functional (Nano) Materials / Nano Science and Technology, Plasma Physics and Radiation Technology, Physics of Transport in Fluids, and Science and Technology of Nuclear Fusion) allow the students to develop advanced disciplinary competences in the majority of areas included in the Domain Specific Framework.

The programme management started to redesign the master's programme to adapt to external circumstances. It was not yet clear to the committee whether the new bachelor's programme sufficiently prepares for the existing master's programme. The recent changes in the bachelor's programme of the TU/e will lead to a more diverse background of the inflow of master's students in 2015. This offers opportunities for the master's programme to achieve more diversity in the output profile of the graduates, including teacher training profiles and Industrial Physics profiles.

The committee values the profile of the master's programme. The tracks are closely connected to the research topics in the Department which allows the students to participate in research groups and get a thorough training in research skills and competences. The tracks furthermore allow the students to develop advanced disciplinary competences in the majority of the areas described in the reference framework.

Intended learning outcomes
Level and orientation of the master's programme are set by the learning outcomes which were formulated on the basis of the Criteria for Academic Competence of the three Universities of Technology (3TU) in the Netherlands.

The critical reflection provides the below listed intended learning outcomes (see also Appendix 3). A graduate of the master's programme:

- Is academically trained within the domain 'science, engineering & technology';
- Is competent in the relevant domain-specific disciplines at the level of the international MSc;
- Can perform research and design independently;
- Is able to involve other disciplines in its research when necessary;
- Has a scientific approach when accessing complex problems and ideas;
- Has the intellectual skills to critically reflect and is able to reason in a logical way in order to arrive at conclusions;
- Is able to communicate at an international level about scientific results;
- Is aware of the temporal and societal context of science and technology and can integrate this in the scientific work;
- Possesses not only a clear domain-specific profile but is also able to collaborate with other disciplines in order to solve research problems (interdisciplinary and multidisciplinary collaboration);
- Actively explores possible applications of research results taking societal context into account.

The committee has studied the intended learning outcomes in relation with the domain specific framework of reference. It concludes that the intended learning outcomes of the master's programme are geared towards starting a PhD-trajectory. The committee is of the opinion that the intended learning outcomes are in line with the domain specific requirements and meet international standards.

The committee, nevertheless, is of the opinion that the intended learning outcomes are quite generic and are, with a few additions, applicable to many other master's degree programmes. It would advise to specify them in relation to the domain of the programme. That way they will provide more focus for the design of the programme and the courses.

Considerations

The committee has taken notice of the developments in Eindhoven with regard to the bachelor's programme and the consequences these will have for the master's programme. The committee is positive about the possibilities these developments offer for the diversity of the graduation profiles of the master's programme.

The committee has established that the master's programme has intended learning outcomes that meet the criteria for level and domain of an academic master's degree programme. The committee recommends specifying the intended learning outcomes in relation tot the domain of the programme.

Conclusion

Master's programme Applied Physics: 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, 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, orientation and structure of the programme, intake and study load, teaching staff and programme specific quality assurance are discussed.

Curriculum
As indicated in standard 1, the master's programme Applied Physics consists of four tracks that students can choose from: Functional Materials, Plasma Physics and Radiation Technology, Physics of Transport in Fluids, and Science and Technology of Nuclear Fusion. The different programmes of these master tracks comply with the following structure:

- A general compulsory module of 10 EC;
- A track-specific compulsory/elective module of 17 EC;
- An elective module of 14 EC;
- An (external/industrial) internship of 19 EC;
- A final graduation project of 60 EC.

The total master's programme comprises 120 EC, evenly distributed over two years. The academic year is divided in four quarters of each ten weeks plus an interim period in August to facilitate re-examination. Each quarter consists of a teaching period of seven weeks. The eighth week is intended for exam preparation and the exams take place in the ninth and tenth week.

The track-specific courses constitute a coherent program that is representative for the intended track. Each of the two compulsory track-specific courses is 4 EC, leaving 9 EC for the specialization electives. The elective module consists of 14 EC, at least 5 EC of which need to be technical electives (as offered by the departments of Physics, Chemistry, Mathematics and Electrical and Biomedical Engineering) and the rest are electives. The common compulsory courses and the compulsory specialization courses are scheduled in the first and third quarter of the academic year, thus facilitating the intake of students at two different moments during the year. The elective courses of the department of AP are taught once every year in one of the four quarters. The traineeship can be carried out in the second or in the fourth quarter.

The master's programme is intended to train students as independent researchers and designers and strongly linked to the research performed at the department. This is especially evident in the track related courses and the final graduation project. Interaction amongst students and between students and lecturers is strong and professional. A significant part of the master's programme is the final graduation project, in which the student actively collaborates in ongoing research that is being carried out in one of the research groups. The

final graduation project may also be carried out outside the department, provided that the project is related to one of the research areas mentioned above and closely (co)supervised by a staff member of the department.

The committee was impressed by the number of students who go abroad for their internship during the master's programme. The students the committee interviewed confirmed that they are stimulated and supported to do this. Many teachers have contacts abroad and the study advisor has an overview of all possibilities. There are also possibilities to get a grant to finance this stay abroad. The students were very positive about the possibilities.

The committee concludes that for an applied physics programme, the master's programme is highly research oriented. Students are mainly prepared for continuing in research, the committee saw less evidence for the training in design. The committee sees some light between the aims of the master's programme, which are also to prepare the master's students for a future in industry and the achieved aims. The committee recommends to paying more attention to context, design and general academic and communication skills in the master's programme, for instance by stimulating industrial internships.

Intake and study load
The high number of outgoing students, as discussed above, is in contrast with the low number of incoming students from abroad. In the view of the committee, there must be a potential to increase this inflow from foreign students by e.g. a targeted information campaign. A more diverse student population is beneficial for the quality of interaction between students in the master's programme. The committee recommends to put effort into attracting more foreign students to the master's programme.

Before the introduction of 'de harde knip' in 2012, the main reason for a long study duration was that bachelor courses still had to be finished during the master's programme. Although the study duration with an average of 31 months is too long, students do not indicate that the study load is too high. In their view, the main reason for the long study duration is the duration of the internship or graduation project. Students often want to finish their project with a positive result. The students are very positive about the guidance they receive during their graduation project. Teachers mentioned that there is growing awareness, in both the students and their supervisors, of the necessity to plan. They expect that the average study duration in the master's programme will decrease.

Teaching staff
The programme has a favourable student staff ratio (see Appendix 5). The teaching staff has the disciplinary expertise to teach the master's programme. The committee finds it very positive that the academic staff is willing to put a lot of effort into teaching. They seem enthusiastic and intensively involved. The positive attitude to education is also indicated by the TU/e policy to develop a teaching career for the staff. The committee noticed during the interviews that teachers and management are aware that good teaching needs time. The Department started relatively late with the BKO (Basic Teaching Qualification Certificate) The number of teachers with this certificate has increased to 50%, but there is still a gap to fill with the percentages at other universities. The committee recommends to have continuous attention for faculty development.

Programme Specific Quality Assurance
The committee concluded on basis of documentation and the interviews that the educational committee (OCN) is proactively performing its tasks in evaluation of courses and quality

assurance. The OCN gathers a lot of evaluation results, which are all discussed in the meetings and communicated with the involved teachers and management of the programme. The results of the evaluations generally lead to improvement measures. The committee was also impressed by the positive involvement and contribution of the student members of the committee.

Considerations

The committee concludes that the content and design of the master's degree programme ensure that students are able to obtain the intended learning outcomes. The committee was impressed by the number of students who go abroad for their internship during the master's programme. This is highly appreciated. However, the number of foreign students flowing into the master's programme is very low. The committee recommends to put effort into attracting more foreign students to the master's programme. The programme is highly research oriented. The committee recommends paying more attention to context and design in the programme.

The study programme is feasible and the study duration has the attention of the staff. The committee is positive about the academic staff delivering the programme. The staff is enthusiastic and intensively involved in teaching. However, the number of teachers with a BKO still needs some attention.

The committee concludes that the Education Advisory Committee function well and that students are generally well involved in the shaping and evaluation of the programmes.

Conclusion

Master's programme Applied Physics: 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

In this section, the system of testing and assessment is discussed and the findings of the committee with regard to the level achieved by the master graduates are described.

System of testing and assessment
During the site visit, the committee studied the testing policy, assessment procedures and test forms. She has seen several tests, assessment forms and answering models. The courses in the general compulsory module (Complex Analysis, Computational Physics, Electrodynamics) are assessed with written exams twice a year. These exams are prepared by the staff member who is responsible for the course, in close collaboration with a colleague. The track specific compulsory courses and courses within the elective module are assessed through the use of various methods such as written or oral exams, writing a paper or a number of assignments. At the end of an external/industrial traineeship, the student has to write a report and give a presentation, both of which are assessed. A final grade for the traineeship is then determined in close consultation with the external supervisor. The student's performance during the traineeship is also taken into account.

A significant part of the master's programme is the final graduation project, which is responsible for half of the total study load. The assessment of this final graduation project involves four components:

- A final thesis;
- An oral presentation;
- An interview and oral examination during which the student has to defend his project before the assessment committee;
- The student's performance during execution of the project.

The assessment committee consists of at least four members and should include:

- The final graduation project supervisor who also acts as the chairperson for the committee;
- The daily project supervisor (who might be the same person as the final graduation project supervisor);
- At least one other member of the research group in which the student has been conducting the final graduation project;
- At least one member from one of the other research groups in the department or an expert from outside the department.

At the end of the student's interview, the committee members will deliberate with each other and thus assess the following aspects of the final graduation project:

- Independence;
- The execution of the graduation assignment;
- Theoretical insight and disciplinary knowledge;
- Creativity;
- The written report;
- The oral presentation;
- The final interview.

Finally, by mutual agreement, a grade for the final graduation project is determined, which is subsequently communicated to the Board of Examiners.

The committee was impressed by this assessment procedure, which can be considered as a best practice. The procedure guarantees involvement of internal and external examiners and optimizes objectivity, validity and reliability of the final assessment.

Since 1 September 2010, the assurance of quality and reliability is the responsibility of the Board of Exams for Applied Physics. The Board of Exams (BoE) explained its intentions and plans to the committee during the site visit. The committee also noticed that a new testing policy has recently been introduced. However, the implementation of the new responsibilities of the BoE is not yet completed. According to the committee, the BoE should make a start with the analysis of the contribution of the course goals to the intended learning outcomes of the curriculum. It is positive that a testing expert has been added to the BoE.

The committee noticed that the BoE not yet fully knows the ins and outs of all its tasks, like fraud policy, plagiarism control and numbers of cum laude graduates. The committee recommends the BoE to take up the new tasks and proactively control the quality of exams and tests.

Achieved learning outcomes
Each member of the assessment committee has read three master's theses to check whether students have achieved the intended learning outcomes. It concludes that the quality of the theses is good and matches the academic level that may be expected of a master's thesis. In general, the committee agrees with the marks assigned to the theses and with the range of the grades. The way the final grade was assessed was not yet transparent for all theses, but the teachers assured that the student is informed about this during the graduation procedure. The committee advises to document the argumentation for the final grade and to make sure that the assessment forms are filled and archived.

Alumni confirmed that the master's programme perfectly prepares the students for a research position. Although the graduates did not have any difficulty in finding a job on an academic level, they reported that for jobs other than research positions, both in university as well as in industry, they lacked general skills like communication with people with another background and experiences like working with a tight time schedule. The committee advises, as is stated under standard 2, to pay more attention to context and general skills in the master's programme.

Considerations

According to the committee, the achieved level of the master's student is satisfactory. The committee assessed all selected master's theses as, at least, satisfactory and agreed generally with the final marks for the theses. The assessment system is according to standards. The graduation procedure is very good and can be considered a best practice. The Board of Exams has started rather late with introducing the new responsibilities. The committee advises to put effort into implementation of its tasks. The committee is positive about the appointment of a testing expert to support the BoE.

Conclusion

Master's programme Applied Physics: the committee assesses Standard 3 as 'satisfactory'.

General conclusion

In the committee's judgement the master's degree programme Applied Physics at Eindhoven University of Technology fulfils the criteria for accreditation. It has noted many positive aspects and suggested several points for improvement. Weighing up those points and the individual assessment of each standard, the committee concludes that the programme 'meets the current generic quality standards and shows an acceptable level across its entire spectrum' and consequently can be assessed as 'satisfactory'.

Conclusion

The committee assesses the *master's programme Applied Physics* as 'satisfactory'.

Appendices

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

Prof. dr. M.J. (Martin) Goedhart has been trained as a biochemist and, from 1982 to 1992, worked as a chemistry teacher in vocational education. In 1990, he got his PhD at Utrecht University with a thesis on chemical education. Between 1992 and 2004, he was assistant professor and associate professor at the University of Amsterdam (UvA), as lecturer in chemical education at the academic teacher training institute, among other things. Since 2004, he is professor of Mathematics and Science Education at the University of Groningen, and, as director of education, responsible for the master's program Education and Communication in Mathematics and Natural Sciences. He leads the research group IDO (Institute for Didactics and Development of Education), which investigates the teaching of math and natural sciences in secondary education and universities. He is editor and member of the editorial committee of national and international research journals, member of the programme committee DUDOC (programme focussed on PhD research by secondary education teachers in science subjects), coordinator of the network chemistry/pharmacy of ICAB (Innovation Centres Academic Beta Education) and chair of faculty's BKO assessment committee. He was a member of the visitation committee of the master's programme Science Education and Communication at the 3TU.

Prof. dr. W. (Wim) de Boer from the Karlsruhe Institute of Technology is a leading expert in the fields of particle - and astroparticle physics. His main interest focuses on the search for the elusive dark matter, which makes up more than 80% of the matter in the universe, but its nature is unknown. Prof. De Boer participates in the search for dark matter using the CMS detector at the Large Hadron Collider (LHC) at the European Particle Physics Laboratory CERN in Geneva and the AMS-02 detector on the International Space Station. He also contributed to the phenomenology of Supersymmetry by showing that Supersymmetry can lead to a Grand Unified Theory with a perfect candidate for a dark matter particle. Prof. De Boer received his PhD at the Delft University of Technology in 1974. Since 2009, he is member of the Advisory Committee IMAPP, Radboud University Nijmegen.

Prof. dr. G. (Guido) van Oost has graduated from Ghent University as an electrotechnical engineer in 1972 and he did his PhD while being a researcher at the Laboratory of Plasma Physics at the Royal Military Academy (LPP-ERM/KMS) Brussels. There he worked as a research associate until he became their leading scientist and permanent representative at the Institute of Plasma Physics (IPP) of the Forschungszentrum Jülich (Germany) on the tokamak TEXTOR in the framework of the coordinated nuclear fusion programme of the European Commission. Since 1999 he has been a full professor of plasma physics at the Department of Applied Physics of Ghent University, responsible for research in the fields of nuclear fusion and plasma treatment of waste and biomass. He supervises 7-10 master theses in nuclear fusion every year. He is coordinator of the Erasmus Mundus "European Master in Nuclear Fusion and Science and Engineering Physics" and of their "International Doctoral College in Fusion Science and Engineering".

Dr. J. (Jan) Hoogenraad did his master's degree in Physics and got his PhD in 1996 at the FOM Institute for Nuclear and Molecular Physics (AMOLF) in Amsterdam. He was Research Scientist of the Philips Natuurkundig Laboratorium (1996-1998), System Engineer, Special Applications division, ASM Lithography (1998-1999), Product Development Manager Software Releases, ASM Lithography (1999-2004) and Manager Test and Quality, Nederlandse Spoorwegen (2003-2009). Since 2009 he has his own company, *Spoorgloren* for change management and quantitative services in public transport. He published 20 papers in acknowledged international Physics Journals and is member of the *Nederlandse Natuurkundige*

Vereniging, The Institute of Physics (London), the American Physical Society and INCOSE (Association for Systems Engineering).

L. (Lisanne) Coenen BSc graduated from the bachelor's programme Applied Physics at Delft University of Technology in 2013. At the same time, she finished her pre master Philosophy of Natural Sciences at Leiden University. Since September 2013, she follows the master's programme Applied Physics (track 'Quantumnanoscience'), also at Delft University of Technology. Additionally, she follows the master's programme Philosophy of Natural Sciences at Leiden University. During her bachelor's programme, she was a board member of the student union for Applied Physics in Delft and in 2012 she was a member of the educational committee for Applied Physics.

Appendix 2: Domain-specific framework of reference

The programme refers in its critical reflection to the analysis made by ACQA (Academic Competences and Quality Assurance) project group, which investigated the academic profile and level of the TU/e study programmes (January 2010, Eindhoven University of Technology.

The descriptors for the master degree programmes can be described with three types of competences, as is done below. The sequence within each category is, with few exceptions, taken from what is called the 'Rating of Importance Order' in the Tuning document.

(a) Discipline-related cognitive competences.

	Specific competence	**Description. On completion of the degree course, the student should**
1	Modelling skills	be able to identify the essentials of a process/situation and to set up a working model of the same; be able to perform the required approximations; i.e. critically think about how to construct physical models.
2	Problem solving skills	be able to evaluate clearly the orders of magnitude in situations which are physically different, but show analogies, thus allowing the use of known solutions in new problems.
3	Knowledge and understanding of Physics	have a good understanding of the important physical theories (logical and mathematical structure, experimental support, physical phenomena described).
4	Familiarity with basic and applied research	acquire an understanding of the nature and ways of physics research and of how physics research is applicable to many fields other than physics, e.g. engineering; be able to design experimental and/or theoretical procedures for: (i) solving current problems in academic or industrial research; (ii) improving the existing results.
5	Frontier research	have a good knowledge of the state of the art in (at least) one of the presently active topics in physics research.
6	Human / professional skills	be able to develop a personal sense of responsibility; be able to gain professional flexibility through the wide spectrum of scientific techniques offered in the curriculum.
7	Physics culture	be familiar with the most important areas of physics and with the common approaches, which span many areas in physics.
8	Absolute standards	have become familiar with highly regarded research in the field thus developing an awareness of the highest standards.

(b) Discipline-related practical skills.

	Specific competence	**Description. On completion of the degree course, the student should**
9	Mathematical skills	be able to understand and master the use of the most commonly used mathematical and numerical methods.

10	Computer skills	be able to perform calculations independently, even when a small PC or a large computer is needed, including the development of software programmes.
11	Experimental skills	have become familiar with most important experimental methods and be able to perform experiments independently, as well as to describe, analyse and critically evaluate experimental data; and to be able to scientifically report the findings.

(c) Discipline-related generic competences.

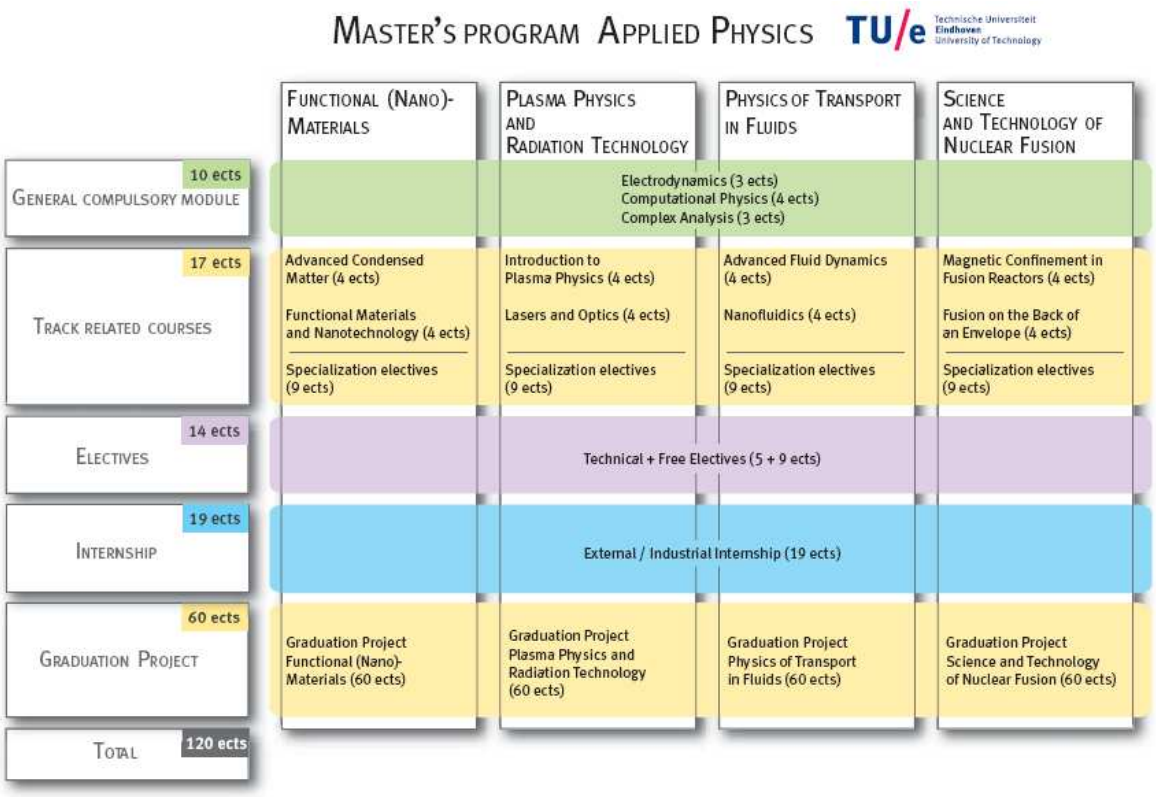
	Specific competence	**Description. On completion of the degree course, the student should**
12	Literature search	be able to search for and use physical and other technical literature, as well as any other sources of information relevant to research work and technical project development; have good knowledge of technical English.
13	Learning ability	be able to enter new fields through independent study.
14	Ethical behaviour (relevant to physics)	be able to understand the socially related problems related to the profession, and to comprehend the ethical characteristics of research and of the professional activity in physics and its responsibility to society.
15	Specific communication skills	be able to listen carefully and to present difficult ideas and complex information in a clear and concise manner to professional as well as to lay audiences; be able to work in an interdisciplinary team.
16	Managing skills	be able to work with a high degree of autonomy, even accepting responsibility in (project) planning, and in the managing of structures.
17	Updating skills	enjoy the facility to remain informed of new developments and methods, and be able to provide professional advice on their possible impact or range of applications.
18	Foreign language skills	have improved command of foreign languages through participation in courses taught in foreign language.

Appendix 3: Intended learning outcomes

The competences that our students need to acquire during the Master's Program are twofold: domain-specific requirements and more generic requirements. A graduate of the Master's Program AP:

- Is academically trained within the domain 'science, engineering & technology';
- Is competent in the relevant domain-specific disciplines at the level of the international MSc;
- Can perform research and design independently;
- Is able to involve other disciplines in its research when necessary;
- Has a scientific approach when accessing complex problems and ideas;
- Has the intellectual skills to critically reflect and is able to reason in a logical way in order to arrive at conclusions;
- Is able to communicate at an international level about scientific results;
- Is aware of the temporal and societal context of science and technology and can integrate this in the scientific work;
- Possesses not only a clear domain-specific profile but is also able to collaborate with other disciplines in order to solve research problems (interdisciplinary and multidisciplinary collaboration);
- Actively explores possible applications of research results taking societal context into account.

Appendix 4: Overview of the curriculum



Appendix 5: Quantitative data regarding the programme

Data on intake, transfers and graduates

Cohort size and origin of Master intake according to VSNU

Year	Cohort Size with origin of Master intake				Total
	TU/e	Other universities NL	HBO	Others	Male/Female
04/ 05	24	1	0	0	23/2
05/ 06	23	0	0	1	21/3
06/ 07	46	1	0	1	46/2
07/ 08	22	0	0	5	23/4
08/ 09	51	0	0	6	52/5
09/ 10	46	1	1	4	49/2
10/ 11	41	2	0	2	44/2
11/12	57	0	1	8	54/12

Study duration for different student categories according to VSNU

Year	Cohort Size with origin of Master intake							
	TU/e		Other universities NL		HBO		Others	
	Number of graduates absolute	Study duration average (months)	Graduates absolute	Study duration average (months)	Graduates absolute	Study duration average (months)	Graduates absolute	Study duration average (months)
04/ 05	2	12	*	*	*	*	*	*
05/ 06	8	13	*	*	*	*	1	22
06/ 07	8	22	*	*	*	*	*	*
07/ 08	27	27	*	*	*	*	3	23
08/ 09	35	31	*	*	*	*	*	*
09/ 10	25	31	*	*	*	*	5	26
10/ 11	37	30	*	*	*	*	6	32
11/12	46	33	2	30	*	*	2	24

* No information

Teacher-student ratio achieved

Student/staff ratio for both the bachelor's and the master's programme

Year	Educational effort	Students	Student/staff ratio
	Number of teachers (+PhD) & educational FTE (+PhD)	Number of enrolled students BSc en MSc (December 1)	Number of enrolled students per staff member & per educational FTE (including PhD)
2010	53 (+157) & 15.5 (+7.9)	379	7.2 & 24.5 (16.2)
2009	49 (+126) & 14.1 (+6.3)	385	7.9 & 27.3 (18.9)
2008	48 (+105) & 13.9 (+5.3)	379	7.9 & 27.3 (19.7)

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

Average per week:

Year	Average hours
1	16*
2	n/a**

* The last quartile (when most students do their internship) is excluded in this number.
** During the second year of the programme, students work on their final graduation project.

Appendix 6: Programme of the site visit

Dag 0		
13 Jan.	19.00	Voorbereidende bijeenkomst en diner commissie Hotel Holiday Inn

Dag 1		
14 Jan.		TNO Eindhoven De Rondom 1 (NB identiteitsbewijs meenemen)
9.30		Vertrek van hotel naar visitatielocatie
10.00	13.15	Documentstudie en verdere voorbereiding incl. lunch
13.15	13.30	Presentatie van het management over het onderwijs
13.30	14.30	Management Prof.dr.ir. G.M.W. Kroesen, Decaan Prof.dr. H.J.H. Clercx, Vice-decaan K.M.J. Alards, Studentadviseur faculteitsbestuur Prof.dr. K.A.H. van Leeuwen, Opleidingsdirecteur Dr. A.M. Duif, Onderwijscoördinator Dr.ir. R.R. Trieling, Studieadviseur / Beleidsmedewerker onderwijs Drs. S.M. Gomez-Puente, Kwaliteitszorgmedewerker / Beleidmedewerker onderwijs Dr.ir. L.P.J. Kamp, Coördinator onderwijsvisitatie
14.30	15.30	studenten Ba en Ma E.G. van Pruissen BSc jaar 1 J.M. Tumelaire BSc jaar 2 R.J. van Gils BSc jaar 3 K.E. Merkus MSc jaar 1 K.K. Schakenraad MSc jaar 2 V.A. van Liebergen MSc, HBO-schakel instroom R. Smedts MSC jaar 1
15.30	15.45	Pauze
15.45	16.45	docenten Ba en Ma Prof.dr.ir. G.J.F. van Heijst Prof.dr.ir. O.J. Luiten Prof.dr. B. Koopmans Dr. C. Storm Dr.ir. P.H.A. Mutsaers Dr. R.A.H. Engeln Dr.ir. G.J.H. Brussaard
16.45	17.15	Alumni Ir. E.M.J. Braeken ASML Ir. T.T.J Clevis ASML Ir. S.A.F. Dielissen Solaytec Ir. B. Macco Promovendus TU/e Dr.ir. A.J.M. Mackus Recent gepromoveerd TU/e Ir. V. Vandalon Promovendus TU/e Ir. D.J.M. Trienekens Promovendus TU/e A.H. Bos Master Biomedical Engineering (BSc Technische Natuurkunde)
17.15	17.45	rondleiding
19:00	21.00	Diner commissie: commissieoverleg in restaurant 'Wissen', Kleine Berg 10

Dag 2		
15 Jan.		
8.15		Vertrek uit hotel naar visitatielocatie
8.30	9.00	Voorbereiden gesprekken
9.00	9.30	OLC Dr. L.J. van IJzendoorn, Voorzitter en staflid Dr. A.A. Bol, staflid Prof.dr. J.D.R. Harting, staflid Prof.dr. P.P.A.M. van der Schoot, staflid M. Valk, studentlid E.H.M.D. Koolen, studentlid M.A.C. van Gestel, studentlid G.E. Hendriks, studentlid
9.45	10.15	examencommissie en studieadviseur Prof.dr. H.J.M. Swagten, voorzitter Dr. P.A. Bobbert, lid Dr.ir. C.F.J. Flipse, lid Dr. R.A.H. Engeln, lid Dr.ir. E.E.M. van Berkum, extern lid (Faculteit Wiskunde en Informatica) Dr.ir. R.R. Trieling, studieadviseur
10.30	11.00	inloopspreekuur
11.00	11.45	voorbereiden eindgesprek
11.45	12.45	Eindgesprek met management
12.45	15.30	Opstellen voorlopige bevindingen (incl. lunch)
15.30	15.45	Mondelinge rapportage voorlopig oordeel
15.45	16.30	Afsluitende borrel

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:

586449	643058	655330
616135	644197	786325
568017	636572	567197
590350	639596	559229
573154	640128	791158

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):

Subjects:

- Electrodynamics (3AP15)
- Micro- and nanofluidics (3T340)
- Introduction in Plasma Physics (3P111)
- Functional materials and nanotechnology (3N340)

Other documents:

- Information Study Association
- Minutes Board of Exams 2010-2012
- Minutes Master degree council 2010-2012
- Assessment form master thesis
- Minutes Board of Advisors 2010-2012
- Alumni survey 2012
- Cum Laude overview 2011-2013
- Faculty reports 2010-2012
- Quality Assurance System TU/e
- Testing policy report
- Examination Regulations
- Research selfassessment 2004-2009
- Research assessment report QANU 2010

Appendix 8: Declarations of independence

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nederlands - vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: M.J. Goedhart

PRIVÉ ADRES: Botanicuslaan 55
9751 AB Haren

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

natuurkunde (B+M)
sterrenkunde (B+M)

AANGEVRAAGD DOOR DE INSTELLING:

Universiteit Leiden

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;

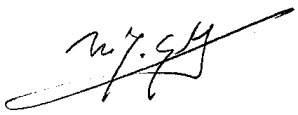
VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

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

PLAATS: Groningen

DATUM: 10 - 12 - 2013

HANDTEKENING:



[redacted]

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Willem de Boer

PRIVÉ ADRES: Dekan-Hofheinz-Str. 26
D-76229 Karlsruhe

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

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;

1

[redacted]

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: Karlsruhe DATUM: 21. 11. 2013

HANDTEKENING:

2

nvao

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: GUIDO VAN OOST

PRIVÉ ADRES: MARKGRAVELEI 137
B-2018 ANTWERPEN

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

NATUUR- EN STERRENKUNDE

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;

nvao

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR N ET 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: 13 DECEMBER 2013

HANDTEKENING:

nvao
nederlands - vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: J.H. HOOGENRAAD

PRIVÉ ADRES:

POSTBUS 2717

3500 GS UTRECHT

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

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;

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: UTRECHT

DATUM: 8 OKTOBER 2013

HANDTEKENING:

2

Q436

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Lisanne Coenen

PRIVÉ ADRES:

Stil Gezicht 9, 2612 RV Delft

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

Natuurkunde bij verschillende universiteiten

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;

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: Delft DATUM: 30 / 10 / 13

HANDTEKENING: 

nvao
nederlands - vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: BARBARA VAN BALEN

PRIVÉ ADRES: KL. Houtweg 8 2012 CH HAARLEM

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

Science and Business Management.

AANGEVRAAGD DOOR DE INSTELLING:

Universiteit Utrecht

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: Utrecht DATUM: 23-1-2014

HANDTEKENING:

2