

Assessment report  
Limited Framework Programme Assessment

**Master Chemical Sciences**

Utrecht University

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## 1. Executive summary

In this executive summary, the panel presents the main considerations which led to the assessment of the quality of the Master Chemical Sciences programme of Utrecht University. The programme was assessed according to the standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands, published on 20 December 2016 (Staatscourant nr. 69458).

The panel regards the programme organisation to be effective.

The panel very much appreciates the programme objectives to educate students thoroughly and in-depth in the field of nanomaterials. The programme aims to teach students both the theoretical concepts and experimental and research skills in this field. The panel appreciates the pronounced and strong research ambition of the programme. The panel welcomes the programme goals to train students in academic skills, ethical and societal awareness and to prepare them for the professional field.

The objectives of the programme are within the boundaries of the domain-specific reference framework for academic chemical sciences programmes. The panel appreciates the efforts by the joint programmes in chemical sciences in the Netherlands to draft this framework and regards this to be a sound and up-to-date description of this domain. The profile of this Utrecht University programme may be distinguished clearly within the framework. The panel regards this profile to be valuable.

The panel supports the programme intentions to educate students primarily for PhD positions and, subsequently, for positions in academic and non-academic research. At the same time, the panel is pleased to note students being given opportunities to qualify for positions in consultancy or management or as teachers in secondary or higher vocational education.

The intended learning outcomes of the programme correspond well to the programme objectives, are comprehensive, well-articulated and conform to the master level.

The panel is pleased to see programme quality being maintained in spite of growing numbers of incoming students.

The curriculum of the programme matches the intended learning outcomes and is well-designed and coherent. The curriculum is solid, with strong courses and very good quality research parts. The panel welcomes students being offered a range of options in the secondary electives part of the curriculum. The academic skills and the career preparation of students are adequately covered.

All staff members have PhDs and have very strong research backgrounds. Their educational capabilities are up to standard, as the substantial proportions of lecturers being BKO-certified or SKO-certified show. The staff is perceived by the panel to be a coherent team. The regular staff meetings on education are positive. The panel noted students being very appreciative of the lecturers.

The panel approves of the entry requirements and the admission procedures of the programme. These are considered to be strict.

The educational concept and study methods of the programme allow for research-intensive, small-scale and activating teaching. The students-to-staff ratio and the number of hours of face-to-face education are generous. The panel is positive about the study guidance. The panel regards the study load to be appropriate. The student success rates are up to standard, study progress being monitored adequately. The panel noted with satisfaction the programme moving to new housing in the foreseeable future.

The programme examination and assessment policies are in line with Graduate School and Faculty rules and regulations. The panel is positive about the responsibilities and activities of the Board of Examiners and the Executive Panel Chemical Sciences, acting on behalf of the Board. The examination methods in the courses meet the course contents. The scheduling of multiple examinations in the courses balances the study load and allows both students' knowledge and skills to be assessed. The internship supervision and assessment procedures are up to standard. The supervision of the Master research projects is organised effectively. The assessment of these projects is conducted reliably. The panel, however, advises to make the thesis assessment processes more transparent.

The panel welcomes the measures taken to ensure the examinations and assessments quality. The panel proposes to introduce standardised plagiarism checks for written assignments, internship reports and Master theses.

The examinations of the courses are very appropriate and quite challenging. The panel supports the grades awarded to the Master theses, recognising the high grades to be warranted. The panel appreciates the theses as being very solid in terms of the scientific structure and the organisation of the report. The proportion of graduates having co-authored journal articles is the confirmation of the level achieved.

The panel is convinced the programme graduates to have reached the intended learning outcomes of the programme. Programme graduates having found suitable positions shortly after graduation is regarded by the panel to be very positive. The panel welcomes the high proportion of graduates having gained PhD positions. The panel is pleased to see graduates obtaining positions in research, but also in consultancy and management and in education.

The panel which conducted the assessment of the Master Chemical Sciences programme of Utrecht University assesses this programme to meet the standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands, judging the programme to be good. Therefore, the panel recommends NVAO to accredit this programme.

Rotterdam, 6 February 2019

Prof. dr. M.A. Cohen Stuart  
(panel chair)

drs. W. Vercouteren  
(panel secretary)

## 2. Assessment process

The evaluation agency Certiked VBI received the request by Utrecht University to support the limited framework programme assessment process for the Master Chemical Sciences programme of this University. The objective of the programme assessment process was to assess whether the programme would conform to the standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands, published on 20 December 2016 (Staatscourant nr. 69458).

Management of the programmes in the assessment cluster WO Scheikunde convened to discuss the composition of the assessment panel and to draft the list of candidates.

Having conferred with Utrecht University Master Chemical Sciences programme management, Certiked invited candidate panel members to sit on the assessment panel. The panel members agreed to do so. The panel composition was as follows:

- Prof. dr. M.A. Cohen Stuart, professor emeritus, chair of Physical Chemistry & Colloid Chemistry, Wageningen University, professor emeritus of Physical Surface Chemistry, University of Twente, professor East China University of Science and Technology, Shanghai, China (panel chair);
- Prof. dr. A.H.T. Boyen, associate professor emeritus, Faculty of Sciences and Bio-engineering Sciences, Faculty of Medicine and Pharmacy, Vrije Universiteit Brussel (panel member);
- Prof. dr. S. Brul, professor, chair Molecular Biology and Microbial Food Safety, University of Amsterdam (panel member);
- Dr. P. Berben, senior research manager BASF, member leadership team BASF De Meern (panel member);
- L. Büller BSc, student Master Life Science and Technology, Delft University of Technology (student member).

On behalf of Certiked, drs. W. Vercouteren served as the process coordinator and secretary in the assessment process.

All panel members and the secretary confirmed in writing being impartial with regard to the programme to be assessed and observing the rules of confidentiality. Having obtained the authorisation by the University, Certiked requested the approval of NVAO of the proposed panel to conduct the assessment. NVAO have given their approval.

To prepare the assessment process, the process coordinator convened with management of the programme to discuss the outline of the self-assessment report, the subjects to be addressed in this report and the site visit schedule. In addition, the planning of the activities in preparation of the site visit were discussed. In the course of the process preparing for the site visit, programme management and the Certiked process coordinator regularly had contact to fine-tune the process. The activities prior to the site visit have been performed as planned. Programme management approved of the site visit schedule.

Well in advance of the site visit date, programme management sent the list of final projects of graduates of the programme of the most recent years. Acting on behalf of the assessment panel, the process coordinator selected the theses of 15 graduates from the last two years. The grade distribution in the selection was ensured to conform to the grade distribution in the list, sent by programme management. In the selection, the distribution across research groups was taken into account. The theses selected are theses of the Master Nanomaterials Science (please refer to chapter 3 of this report).

The panel chair and the panel members were sent the self-assessment report of the programme, including appendices. In the self-assessment report, the student chapter was included. In addition, the expert panel members were forwarded a number of theses of the programme graduates, these theses being part of the selection made by the process coordinator.

Several weeks before the site visit date, the assessment panel chair and the process coordinator met to discuss the self-assessment report provided by programme management, the procedures regarding the assessment process and the site visit schedule. In this meeting, the profile of panel chairs of NVAO was discussed as well. The panel chair was informed about the competencies, listed in the profile. Documents pertaining to a number of these competencies were presented to the panel chair. The meeting between the panel chair and the process coordinator served as the briefing for panel chairs, as meant in the NVAO profile of panel chairs.

Prior to the date of the site visit, all panel members sent in their preliminary findings, based on the self-assessment report and the final projects studied, and a number of questions to be put to the programme representatives on the day of the site visit. The panel secretary summarised this information, compiling a list of questions, which served as a starting point for the discussions with the programme representatives during the site visit.

Shortly before the site visit date, the complete panel met to go over the preliminary findings concerning the quality of the programme. During this preliminary meeting, the preliminary findings of the panel members, including those about the theses were discussed. The procedures to be adopted during the site visit, including the questions to be put to the programme representatives on the basis of the list compiled, were discussed as well.

On 12 June 2018, the panel conducted the site visit on the Utrecht University campus. The site visit schedule was as planned. In a number of separate sessions, the panel was given the opportunity to meet with Faculty Board representatives, programme management, Board of Examiners members, lecturers and final projects examiners, and students and alumni.

In a closed session near the end of the site visit, the panel considered every one of the findings, weighed the considerations and arrived at conclusions with regard to the quality of the programme. At the end of the site visit, the panel chair presented a broad outline of the considerations and conclusions to programme representatives.

Clearly separated from the process of the programme assessment, the assessment panel members and programme representatives met to conduct the development dialogue, with the objective to discuss future developments of the programme.

The assessment draft report was finalised by the secretary, having taken into account the findings and considerations of the panel. The draft report was sent to the panel members, who studied it and made a number of changes. Thereupon, the secretary edited the final report. This report was presented to programme management to be corrected for factual inaccuracies. Programme management were given two weeks to respond. Having been corrected for these factual inaccuracies, the Certiked bureau sent the report to the University Board to accompany their request for re-accreditation of this programme.

### 3. Programme administrative information

Name programme in CROHO: M Chemical Sciences  
Orientation, level programme: Academic Master  
Grade: MSc  
Number of credits: 120 EC  
Specialisations: N.A.  
Location: Utrecht  
Mode of study: Full-time (language of instruction is English)  
Registration in CROHO: 21PD-60706

Name of institution: Utrecht University  
Status of institution: Government-funded University  
Institution's quality assurance: Approved

The Master Chemical Sciences programme is a master degree programme of Utrecht University. The name of the actual master programme is Nanomaterials Science. Up to August 2018, the master degree programme included two other master programmes, Master Drug Innovation and Master Molecular and Cellular Life Sciences. As of August 2018, these programmes will be part of the degree programme Master in Biosciences. This is the result of the process of rearranging master programmes within Utrecht University. Therefore, the only master programme being offered under the degree programme Master Chemical Sciences will be the Master Nanomaterials Science programme.

As the assessment regards the CROHO-registered degree Master programme, throughout this report the programme will be referred to as Master Chemical Sciences. In the assessment process of the degree programme, the focus has been on the Master Nanomaterials Science programme.

## 4. Findings, considerations and assessments per standard

### 4.1 Standard 1: Intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.
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#### *Findings*

The Master Chemical Sciences is one of the programmes of the Faculty of Science of Utrecht University. Within the Faculty, the programme is part of the Graduate School of Natural Sciences. The Board of Studies of the School has the responsibility for the organisation and the quality of this and the other Master programmes of the School. The Education Council, consisting of students and lecturers, evaluates the programme quality and advises the Board of Studies. The Council may delegate responsibilities for this programme to the Education Advisory Committee. The Board of Examiners of the Graduate School of Natural Sciences has the authority to monitor the quality of the examinations and assessments of this programme. On behalf of the Board, the Executive Panel Chemical Sciences takes care of the quality control of the assessments and individual requests by students. The Board of Admissions of the School is responsible for the admission of candidate students. The lecturers in the programme are employed at and recruited from the Department of Chemistry of the Faculty. Some lecturers come from the Department of Physics. The day-to-day management of the programme is in the hands of the director of education of the programme in collaboration with the programme coordinator. The director of education is also a member of the Board of Studies of the Graduate School of Natural Sciences.

The Master Chemical Sciences is a two year research-based, academic master programme in the chemical sciences domain.

The objectives of the programme are to educate students in fundamental theoretical knowledge about nanomaterials and their synthesis, characterisation, properties and application and to train students in experimental and theoretical skills, required to perform competitive research in the fields of catalysis, colloid science and nanophotonics. The programme is especially directed towards the synthesis, performance and modelling of nanomaterials often for the conversion, storage and more efficient use of energy. The programme aims to integrate theory and research. Within this domain, the programme offers students a number of specific research areas to graduate in.

The objectives of the programme conform to the domain-specific Frame of Reference Chemical Sciences in the Netherlands, which has been drafted by the joint programmes of this assessment cluster in the Netherlands. In this domain-specific framework, reference has been made to international frameworks and benchmark statements. This Utrecht University programme may be regarded to be placed within the chemistry sub-domain of the chemical sciences. Compared to other master programmes in this field in the Netherlands, this programme is focused on the study of nanomaterials science subjects, allowing students to spend 90 EC to 120 EC of their curriculum on the study of these subjects.



The programme prepares students for positions on the labour market. Students are educated for positions in academia, research & development, consultancy, secondary school education or policy making. Although the programme primarily aims to educate students for PhD positions, the programme also offers students the opportunities to qualify for positions in management or consultancy. In addition, students may choose to become fully-qualified teachers in Chemistry in Dutch secondary education or higher vocational education.

The programme objectives have been translated into the intended learning outcomes of the programme. These include knowledge and understanding of the theoretical concepts of and the research in nanomaterials, with the emphasis on colloids, catalysts and nanophotonics, research skills in this domain, academic skills, including communication and collaborative skills in multi-disciplinary teams, integrity and ethical and societal awareness and understanding how to have successful careers in academia or the professional field.

Programme management drafted a table, mapping the programme intended learning outcomes to the Dublin descriptors for master programmes, from which the correspondence of the intended learning outcomes to these Dublin descriptors may be inferred.

#### *Considerations*

The panel regards the programme organisation to be effective.

The panel very much appreciates the programme objectives to educate students thoroughly and in-depth in the field of nanomaterials. The programme aims to teach students both the theoretical concepts as well as the experimental and research skills in this field. The panel appreciates the programme goal to integrate theory and research. The panel noted the research ambition of the programme to be pronounced and to be very strong. The panel welcomes the academic skills, ethical and societal awareness and preparation for the professional field.

The objectives of the programme are within the boundaries of the domain-specific reference framework for academic chemical sciences programmes. The panel appreciates the efforts by the joint programmes in chemical sciences in the Netherlands to draft this framework and regards this to be a sound and up-to-date description of this domain. The profile of this Utrecht University programme may be distinguished clearly within the framework. The panel regards this profile to be valuable.

The panel supports the programme intentions to educate students primarily for PhD positions and, subsequently, for positions in academic and non-academic research. At the same time, the panel is pleased to note students being given opportunities to qualify for positions in consultancy, management or as teachers in secondary or higher vocational education.

The intended learning outcomes of the programme correspond well to the programme objectives. These intended learning outcomes are comprehensive, well articulated and stated in clear terms. The intended learning outcomes conform to the master level. This is exemplified by the Dublin descriptors criteria for master level programmes matching the intended learning outcomes.

*Assessment of this standard*

These considerations have led the assessment panel to assess standard 1, Intended learning outcomes, to be good.

## 4.2 Standard 2: Teaching-learning environment

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

### *Findings*

The number of students entering the programme rose substantially over the years, going from 19 students in 2010 via 27 students in 2014 to the influx of 37 students in 2017. About 70 % to 80 % of the students come from the Bachelor Chemistry programme of Utrecht University. The influx of other students comprises about equal proportions of students from other Dutch universities, students with bachelor degrees from higher vocational education institutes (hbo) and students from abroad.

The study load of the curriculum is 120 EC and the curriculum takes two years to complete. Programme management presented a table, showing the curriculum to cover all of the intended learning outcomes. The curriculum is composed of four separate parts, being mandatory courses (15 EC), primary elective courses (22.5 EC), Master research project and thesis (52.5 EC) and secondary electives (30 EC). The order in which to take the courses and do the projects may be freely chosen by students, provided the internship, being one of the options of the secondary electives, is scheduled after the Master thesis. The mandatory courses are the content-driven course *Adsorption, Kinetics and Catalysis* and the course *Academic Context*, which is meant to train students' writing and presentation skills, requiring students to present research findings to the Debye research institute community. This course includes orientation on the labour market. Part of the mandatory courses are two smaller courses on scientific integrity and ethical awareness. The three primary elective courses provide students with in-depth knowledge and understanding of concepts, theories and techniques in the fields of catalysis, colloids or nanophotonics. Students may take all three courses in one of these fields or may select courses from different fields. In some courses, students sit together with Physics students, allowing them to learn from students with different backgrounds. The Master research projects are conducted at one of the Debye Research Institute for Nanomaterials Science research groups. Students are required to complete the entire research cycle, comprising literature study, designing experiments, analysing and discussing results, drawing conclusions and reporting in line with international standards. For the secondary electives, students may take elective courses, take an internship or choose one of the three profiles offered. The profiles allow students to prepare for positions in education or broaden their education in *Complex Systems* or in *Applied Data Science*. About 90 % of the students opt for internships, sometimes taken abroad. Internships are to be taken at research institutes or in industry. Most students choose 37.5 EC of course work and 82.5 EC of research projects, meaning they select research internships. In addition to the regular curriculum, talented students may opt for honours programmes, allowing them to extend their education. The extracurricular *Chemistry Career Week*, offered by the programme and the study association, introduces students to career perspectives in the professional field.

The staff lecturing in the programme are 42 lecturers (about 40 fte). As has been indicated, most lecturers are employed at the Department of Chemistry, whereas some of them are employees of the Department of Physics. The Departments scored excellent results in recent research evaluations. All lecturers are researchers in the Debye Research Institute for Nanomaterials Science, which consists of six research groups. The lectures in the programme are, therefore, active researchers in this domain, all of them having PhDs. About 76 % of them are BKO-certified and a number of others are in the process of obtaining this certificate. About 62 % of the lecturers are SKO-certified. The BKO-certificate is a prerequisite to obtain permanent positions. In monthly staff meetings, the programme is discussed. In addition, staff meet in the committee of lecturers and within sections of the Department. Lecturers are very much appreciated by students. The work load of the lecturers is balanced. Representatives from industry participate as part time lecturers and supervisors.

The entry requirements are for applicants to have Bachelor degrees from Dutch universities with a major in chemistry or a major in science with pronounced chemistry components or comparable prior education. All applicants should submit their application to the Board of Applications. In addition to the checking the formal requirements, this Board reviews motivation letters and bachelor degree results. Students from abroad have to present two reference letters and proof of their command of English. Students coming from higher vocational education institutes (hbo) are to take the 30 EC pre-master programme, before being admitted.

The educational concept of the programme is to offer research-intensive, student-centred and student-activating teaching. In the Master research projects, students intensively trained in research in this field within the research groups of the Debye Institute. In the courses, small groups of students engage in lecturer-student interaction in lectures and tutorials. The students-to-staff ratio is 7.0 : 1, excluding PhD students. This suggests small-scale education. Study methods adopted are writing assignments, project-based work assignments, group discussions, peer-reviewing and presentations. Computer-based study methods are introduced gradually. In the first weeks of the programme, students are informed about the programme and the research done at research groups of the Debye Institute. The director of education and the programme coordinator guide students in designing their study paths. The number of hours of face-to-face education in course periods typically is about 16 hours per week. In the Master research projects and the internships, students are individually supervised. Safety issues are addressed in the laboratories. The mandatory courses are meant to reinforce the community building among students in the programme. Students regard the study load to be manageable. Programme management monitors the study progress of students. The average student success rates are about 38 % after two years and about 78 % after three years (figures for the last four to five cohorts). As some students may take long to complete their programme, go/no go moments have been introduced to encourage these students to discontinue their studies.

### *Considerations*

The panel is pleased to see programme quality being maintained in spite of growing numbers of incoming students.

The curriculum of the programme matches the intended learning outcomes and is well-designed and coherent. The curriculum coherence for individual students is ensured through the guidance by the director of education and the programme coordinator. The curriculum is considered by the panel to be solid, with strong courses. The research parts in the curriculum are very pronounced and of very good quality, which is highly appreciated by the panel. The panel welcomes students being offered a range of options in the secondary electives part of the curriculum. The panel considers the academic skills and the career preparation of students to be adequately covered.

The staff in the programme are all PhDs and they have very strong research backgrounds. Their educational capabilities are up to standard, as the substantial proportions of lecturers being BKO-certified or SKO-certified show. The staff is perceived by the panel to be a coherent team. The regular staff meetings on education are very positive. In addition, the panel welcomes representatives of industry lecturing in the programme. The panel noted students being very appreciative of the lecturers.

The panel approves of the entry requirements and the admission procedures of the programme. These are considered to be strict.

The educational concept and study methods of the programme are appropriate, allowing for research-intensive, small-scale and activating teaching. The students-to-staff ratio and the number of hours of face-to-face education are generous. The panel is positive about the study guidance. The panel regards the study load to be appropriate. The student success rates are up to standard, study progress being monitored by programme management. The panel noted with satisfaction the programme moving to new housing in the foreseeable future.

### *Assessment of this standard*

These considerations have led the assessment panel to assess standard 2, Teaching-learning environment, to be good.

### 4.3 Standard 3: Student assessment

The programme has an adequate system of student assessment in place.

#### *Findings*

The programme policies regarding examinations and assessments are in line with Graduate School of Natural Sciences assessment policy plan, meeting Faculty of Science examination policies. As has been indicated, the Board of Examiners of the Graduate School of Natural Sciences has the responsibilities to monitor examinations and assessments in this programme. The Executive Panel Chemical Sciences of the Board takes care of the quality control of the assessments and individual requests by students.

The examination methods in the programme include written examinations, assignments, reports and presentations. In most courses, multiple examination methods are scheduled. The final grade of the courses is the weighted outcome of the grades of these examinations.

Students are to obtain the approval for the Master research project, to ensure scientific quality. Students may conduct their project at any one of the six research groups of the Debye Institute. Before the start of the Master research project, the practical details of the projects are laid down in the supervision plan. As has been said, students have to show being able to complete the research cycle, at the end of the project submitting their thesis. The project has been split in two parts, the initiation phase (15 EC), comprising the problem statement, literature search, research approach and first results, and the research with thesis phase (37.5 EC), executing the project and writing the thesis. The project is supervised by one of the staff members and on a day-to-day basis by PhD students. Both phases are assessed by the supervisor and the second reader, the latter not having been involved in the project. Second readers may come from other research group. A negative assessment of the initiation phase may result in students having to start a new project or even to leave the programme. The final phase is assessed by the examiners, using the thesis scoring form with assessment criteria assessing the process (30 % of grade), research competencies (30 %), written report (30 %) and oral presentation (10 %). Rubrics forms are being used since 2017/2018.

The supervision and assessment procedures for the internships are quite similar to those of the Master projects. The external supervisor advises on the students' performances. The university examiners assess and grade the internship, using the scoring form with assessment criteria research (50 % of grade), report (33 %) and presentation (17 %). Master theses or internship reports are to be checked for plagiarism or fraud, but not systematically.

In the programme, a number of measures have been taken to ensure the quality of examinations and assessments. The assessment plan for the programme has been drafted, aligning the intended learning outcomes of the programme, course objectives and course examinations. Examiners are appointed by the Board of Examiners, they being required to be BKO- or SKO-certified. Assessment matrices and model answers are part of the course examinations. Examination results are analysed, but not yet all of them. The Executive Panel Chemical Sciences of the Board regularly reviews samples of examinations and theses, verifying contents, validity, reliability and transparency.

### *Considerations*

The panel observed the programme examination and assessment policies to be in line with the Graduate School and Faculty rules and regulations. The panel is positive about the responsibilities and activities of the Board of Examiners and the Executive Panel Chemical Sciences, acting on behalf of the Board.

The examination methods selected in the courses are approved by the panel, as they meet the course contents. The scheduling of multiple examinations in the courses balances the study load and allows both students' knowledge and skills to be assessed.

The internship supervision and assessment procedures are up to standard.

The Master research projects supervision is organised effectively. The assessment of these projects is conducted reliably. The panel, however, advises to make the thesis assessment processes more transparent.

The panel welcomes the measures taken by programme management to ensure the examinations and assessments quality. Examiners are appointed by the Board of Examiners. The validity of the examinations is promoted through the programme assessment plan and the course assessment matrices. The reliability of the assessments is fostered by model answers and assessment forms. The panel is positive about the regular reviews of examinations and theses by the Executive Panel Chemical Sciences. The panel proposes to introduce standardised plagiarism checks for written assignments, internship reports and Master theses.

### *Assessment of this standard*

The considerations have led the assessment panel to assess standard 3, Student assessment, to be satisfactory.

#### 4.4 Standard 4: Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

##### *Findings*

The panel studied the examinations of a number of courses of the programme.

The panel also reviewed the Master theses of fifteen graduates of the programme with different grades. The average grade of the theses of the graduates of the last two years is 8.0. About 25 graduates of the years 2015 to 2017 succeeded in co-authoring journal articles. This may be estimated to be about 20 % to 30 % of the graduates in this period.

Programme management recently conducted a survey among alumni, graduated from 2004 to 2017. The results of the survey show 63 % of the graduates having found positions immediately after the graduation and 91 % of the graduates having been employed within six months after their graduation. In total, no less than 69 % of the graduates secured PhD positions. Others found employment in research, management, consultancy, education or policy making. After a number of years, positions of programme graduates included PhD positions (29 %) researchers in companies (19 %), researchers in academia (13 %), consultants (8 %), managers (6%) and teachers in secondary education (2 %) or in higher vocational education (3 %).

##### *Considerations*

The examinations of the courses which were reviewed by panel members were very appropriate and quite challenging.

The panel supports the grades awarded to the Master theses, recognising the high grades of the theses to be warranted. The panel appreciates the theses as being very solid in terms of the scientific structure and the organisation of the report. For the panel, the proportion of graduates having co-authored journal articles is the confirmation of the level achieved in the theses.

The panel is convinced the programme graduates to have reached the intended learning outcomes of the programme. The survey conducted among graduates is comprehensive. Programme graduates having found suitable positions shortly after graduation is regarded by the panel to be very positive. The panel welcomes the high proportion of graduates having gained PhD positions. The panel is pleased to see graduates obtaining positions in research, but also in consultancy and management and in education.

##### *Assessment of this standard*

The considerations have led the assessment panel to assess standard 4, Achieved learning outcomes, to be good.



## 5. Overview of assessments

Standard	Assessment
Standard 1: Intended learning outcomes	Good
Standard 2: Teaching-learning environment	Good
Standard 3: Student assessment	Satisfactory
Standard 4: Achieved learning outcomes	Good
Programme	Good

## 6. Recommendations

In this report, a number of recommendations by the panel have been listed. For the sake of clarity, these have been brought together below.

- To make the assessment processes of the Master thesis more transparent.
- To introduce standardised plagiarism checks for written assignments, internship reports and Master theses.