

Assessment report
Limited Framework Programme Assessment

Master Chemistry

University of Amsterdam and VU Amsterdam

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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 joint-degree Master Chemistry programme of University of Amsterdam and VU Amsterdam. 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 collaboration of the two Faculties of University of Amsterdam and VU Amsterdam to be well-organised and successful. The panel welcomes the Universities' initiatives to offer this broad master programme, offering students many options in this field. The panel recommends to further align the administrative procedures of the two Universities with respect to the programme.

The programme objectives are sound. The panel appreciates the breadth of the programme, educating students thoroughly in the chemistry discipline and offering a wide range of sub-disciplines. The programme is well aligned with current scientific research and offers up-to-date education. The panel appreciates students being offered specialisations, allowing them to gain in-depth knowledge and skills in specialised fields.

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 University of Amsterdam and VU Amsterdam programme may be clearly distinguished within the framework.

The panel appreciates students being given opportunities to prepare not only for positions in academic and non-academic research, but also for positions as managers or policy-makers, fully-qualified teachers in chemistry in Dutch secondary education or science communication specialists.

The intended learning outcomes of the programme meet the programme objectives, are comprehensive and are conform to the master level.

The panel regards the influx of students to be both substantial and diverse. The panel recommends using study and laboratory facilities at both campuses to alleviate constraints with regard to student numbers. Although the entry requirements and admission procedures of the programme are adequate, the panel proposes to make the premaster programme more challenging and more selective, to straighten differences in prior knowledge among students.

The curriculum matches the programme intended learning outcomes. The panel appreciates the contents of the curriculum, offering students thorough research-based education in the chemistry discipline. The panel welcomes the specialisations and variants being offered to students. The curriculum is considered by the panel to be well-thought-through and to be coherent. Although the programme maintains contacts with the professional field, the panel advises to intensify the relations with the professional field further.

The lecturers in the programme are perceived by the panel to be well-reputed researchers and qualified teachers. The panel greets the positive opinion of students about the lecturers.

The panel regards the educational concept and the study methods to be appropriate, promoting student-activating learning. The panel suggests to pursue the introduction of new study methods more actively. The number of hours of face-to-face education meets the standards. The study guidance by the track coordinators and study advisor is appropriate. The panel greets the Personal Education Plan to structure individual curricula. The programme is challenging but feasible. The panel regards the student success rates to be somewhat disappointing and suggests to try and improve these.

The panel regards the examination and assessment regulations for the programme to be appropriate.

The examination methods in the programme are consistent with the goals and contents of the courses. The panel is positive about measures being taken to counter free-riding and to prevent fraud and plagiarism.

For the Master research projects, the supervision and assessment processes are up to standard. The panel advises to add more extensive written comments on the projects' assessment forms and suggests to implement rubrics scoring forms for the projects to further increase the reliability of the assessments.

The panel welcomes the assessment plan, specifying the measures to be taken to ensure the validity, reliability and transparency of examinations and assessments. The panel notes not all of these measures having yet been fully adopted by examiners. The panel expects that this will be done in the near future.

The course examinations are appropriate. The Master research projects studied qualify as academically sound research projects at master level. The quality and level of the projects differed, which was duly reflected in the grades. The panel generally supports the grades awarded to the research projects by the programme examiners. In a few cases, the grades were, however, overrated.

The panel considers the graduates of the programme to have reached the intended learning outcomes and regards these graduates to be well prepared for suitable positions in this domain, both within academia and in industry. The panel proposes to inform students more intensively about non-PhD positions and students' prospects to acquire these positions.

The panel which conducted the assessment of the joint-degree Master Chemistry programme of University of Amsterdam and VU Amsterdam 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 satisfactory. Therefore, the panel recommends NVAO to accredit this programme.

Rotterdam, 7 March 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 University of Amsterdam and VU Amsterdam to support the limited framework programme assessment process for the joint-degree Master Chemistry programme of these Universities. 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 management of the Master Chemistry programme of University of Amsterdam and VU Amsterdam, 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. R.M.J. Liskamp, professor, chair of Chemical Biology and Medicinal Chemistry, School of Chemistry, University of Glasgow, United Kingdom, professor of Molecular Medicinal Chemistry, Utrecht University (panel member);
- Drs. O. de Vreede, head Innovation and Human Capital, VNCI, Association of the Dutch Chemical Industry (panel member);
- A.E.M. Melcherts BSc, student Master in Nanomaterials Science, Utrecht University (student member).

On behalf of Certiked, drs. W. Vercoouteren 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 few years. The grade distribution in the selection was ensured to conform to the grade distribution in the list, sent by programme management.

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 31 October 2018, the panel conducted the site visit on the University of Amsterdam campus. The site visit schedule was as planned. In a number of separate sessions, the panel was given the opportunity to meet with representatives of the Faculties of both universities, programme management, Examinations Board members, lecturers and final projects examiners, and students and alumni.

In a closed session at 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, 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 Board of University of Amsterdam, being the administrative host institution for this programme, to accompany their request for re-accreditation of this programme.

3. Programme administrative information

Name programme in CROHO: M Chemistry (joint degree programme)
Orientation, level programme: Academic Master
Grade: MSc
Number of credits: 120 EC
Specialisations: Analytical Sciences
Molecular Sciences
Science for Energy and Sustainability
Atomic Scale Modelling of Physical, Chemical and Bio-Molecular
Systems
Location: Amsterdam
Mode of study: Full-time and part-time (language of instruction English)
Registration in CROHO: 21PK-65012/21PL-65012
Name of institutions: University of Amsterdam and VU Amsterdam
Status of institutions: Government-funded Universities
Institutions' quality assurance: Approved

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.

Findings

The joint-degree Master Chemistry programme is offered by the Faculty of Science of University of Amsterdam and the Faculty of Science of VU Amsterdam, University of Amsterdam being the administrative host institution. The collaboration of the Universities with respect to this joint degree programme is governed by the agreement of cooperation, drafted by them. In the year 2015, the programme has been awarded the official joint degree programme status. Before that year, the programme was already offered jointly by the Universities. The Boards of the Faculties mentioned are jointly responsible for the programme quality. In organisational terms, the programme is part of the College of Science of the Faculty of Science of University of Amsterdam. The director of the programme is appointed by the deans of both Faculties. Being assisted by the programme coordinator and the track coordinators for the programme specialisations, she takes care of programme management. One set of Teaching and Examination Regulations applies for the programme. The joint Programme Committee, consisting of an equal number of lecturers and students, advises programme management on quality issues. The equally joint Examinations Board has the authority to ensure the quality of examinations and assessments of the programme. Members of the Programme Committee and the Examinations Board are appointed by the Faculty Boards of both Universities.

The joint-degree programme Master Chemistry allows the two Universities to benefit from the research and educational capacities of both institutions and to offer the broad spectre of subjects in the chemistry discipline at master level.

The Master Chemistry programme is a two-year, research-based, broad master programme in the chemistry discipline, which covers sub-disciplines ranging from fundamental theoretical and physical chemistry to sustainable chemistry and analytical chemistry. The programme objectives are to educate students comprehensively in this discipline, to offer them in-depth knowledge and skills in one of the programme specialisations, to train them in academic research in this domain, and to provide them with academic skills relevant for this domain.

In the programme, four specialisations are offered, being Analytical Sciences, Molecular Sciences, Science for Energy and Sustainability and Atomic Scale Modelling of Chemical, Physical and Biomolecular Systems. The specialisation Analytical Sciences educates students broadly in methods, techniques and application areas of current analytical chemistry. The specialisation Molecular Sciences allows students to study the combination of fundamental subjects in chemistry, such as synthetic chemistry, physical chemistry and computational chemistry. The specialisation Science for Energy and Sustainability combines research in energy and sustainability with societal, business and governmental dimensions of this field. The international specialisation Atomic Scale Modelling of Chemical, Physical and Biomolecular Systems educates students in computer modelling in chemical, physical and biomolecular sciences. Students take courses in Amsterdam, Lyon and Rome.

The objectives of the programme conform to the domain-specific reference framework for the 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 University of Amsterdam and VU Amsterdam programme is conform to this framework and may be regarded to be positioned in the chemistry sub-domain of chemical sciences.

The programme prepares students for the labour market. Students may select one of the four variants or majors offered, being Research, Education, Science in Society or Science Communication. The Research variant prepares students for PhD positions, careers at research institutes or for positions in industry. The Education variant trains students to become fully-qualified teachers in Chemistry in Dutch secondary education. In the Science in Society variant, students are educated to contribute to managerial or policy decision-making in industry. The Science Communication and Society variant prepares students for careers in science communication and popularisation.

The programme has been compared to other programmes in the Netherlands as well as to programmes in Germany. From this comparison may be deduced the programme resembles these programmes, but to be somewhat broader than most other programmes in the Netherlands.

The objectives of the programme have been translated into the intended learning outcomes. The main intended learning outcomes are thorough theoretical and practical knowledge of modern chemistry, in-depth research knowledge and skills in at least one sub-discipline of chemistry, communication skills, knowing how to apply chemistry knowledge in a broader, multi-disciplinary context, and insight in the role of chemistry in society. For each of the specialisations mentioned, additional intended learning outcomes have been formulated, specifying these general intended learning outcomes.

The intended learning outcomes correspond to the Dublin descriptors, showing these to match the master level.

Considerations

The panel regards the collaboration of the two Faculties of University of Amsterdam and VU Amsterdam to be well-organised and successful. The panel welcomes the Universities' initiatives to offer this broad master programme, allowing students to acquire comprehensive education in the chemistry domain, and offering students many options in this field. The panel recommends to further align the administrative procedures of the two Universities with respect to the programme.

The panel considers the programme objectives to be sound. The panel appreciates the breadth of the programme, educating students thoroughly in the chemistry discipline and offering a wide range of sub-disciplines within this domain. The programme is well aligned with current scientific research in this domain and offers up-to-date education. The panel appreciates students being offered specialisations, allowing them to gain in-depth knowledge and skills in specialised fields.

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 University of Amsterdam and VU Amsterdam programme may be clearly distinguished within the framework.

The panel appreciates students being given opportunities to prepare not only for positions in academic and non-academic research, but also for positions as managers or policy-makers, fully-qualified teachers in chemistry in Dutch secondary education or science communication specialists.

The objectives have been well-translated into the intended learning outcomes of the programme. The intended learning outcomes are comprehensive and are conform to the master level.

Assessment of this standard

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

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 incoming students in the programme remained rather stable in the years 2014 to 2016 at the influx of about 100 students, to rise to 126 incoming students in 2017. The current number of incoming students can be accommodated. The programme sets the maximum number at 150 students. About 25 % to 38 % of the students have taken the joint degree Bachelor Chemistry programme of University of Amsterdam and VU Amsterdam, between 23 % and 48 % originate from other universities and 25 % to 48 % have bachelor degrees from higher vocational education institutes (hbo). About 24 % of the incoming students are from abroad. The entry requirements are the bachelor degree in chemistry or equivalents from Dutch universities. Students with hbo bachelor degrees may enrol only after having taken the premaster programme of 30 EC. Foreign students are to report the grade point average in their prior education and proficiency in the English language. Applications by foreign students are screened by the track coordinator, who advises the programme director on admission.

The programme is offered in full-time and part-time study modes. Part-time students take the same courses as full-time students, but they take less courses per period. Master research projects' requirements do not differ. The Master research projects of part-time students are arranged most of the time in the student's work setting. Part-time students complete the programme in 3.5 years on average. The number of part-time students is about 5 students per year.

The curriculum has 120 EC study load and takes two years to complete for full-time students. Programme management presented a table, mapping the curriculum components to the intended learning outcomes. The Research variant curriculum is composed of both general courses and track- or specialisation-specific courses. The general courses for all students include two courses, the Literature thesis & colloquium course (12 EC) and the Master research project (42 EC to 60 EC). In the Literature thesis & colloquium course, students draft in-depth literature reviews within their specialisation. In the Research project, students design and execute individual research at one of the research groups, participating in the programme. Students may also opt for external projects at research institutes or in industry. The track- or specialisation-specific courses include both track-specific obligatory courses and elective courses. In these courses, students acquire theoretical and practical knowledge of the specialisation of their preference. Students opting for the Education, Science in Society or Science Communication variants take majors or minors (60 EC or 30 EC), preparing them for these variants. The study load of the Literature study (6 EC) and Research project (36 EC) are less than in the Research variant to make room for these majors or minors.

A total number of 120 lecturers lecture in the programme. The lecturers are mainly researchers at one of the research groups of the Van 't Hoff Institute for Molecular Sciences or the Swammerdam Institute for Life Sciences of University of Amsterdam or the Amsterdam Institute of Molecules, Medicines and Systems of VU Amsterdam. The research quality of these institutes is very high. As lecturers of both Universities are involved, the spectre of expertise offered is substantial. Nearly all staff members have PhDs. About 58 % of the total number of lecturers are BKO-certified, including lecturers still in the process of acquiring the certificate. Lecturers meet two times per year to discuss the programme. Guest

lecturers from industry teach in the programme. PhD students and postdocs are involved in the programme as teaching assistants and daily supervisors of Master research projects. Students expressed appreciating the lecturers and considering them to be easily approachable.

The educational concept of the programme is research-based learning and leads students from lecturer-centred education to individual master/apprentice learning. Student-activating learning is promoted in the courses and in small-scale projects. The study methods in the cursory parts of the curriculum adopted are lectures, assignments and self-study. Lecturers are informed about ICT-based teaching methods. The average number of hours of face-to-face education in the curriculum is about 9 to 12 hours per week in the cursory parts of the curriculum and about two to three hours per week during the Literature thesis and the Research project. The main point of contact and advice for students are the track coordinators. The study advisor may be addressed by students in case of problems. Advised by the track coordinator, students draft their Personal Education Plan, outlining their individual curriculum. In the course of the curriculum, this plan may be updated, aligning it with study and career options. Approval by the track coordinator and the Examinations Board is required, before students may apply for the Master diploma. As the laboratory facilities at the University of Amsterdam campus are constrained, the programme considers moving practical classes to the VU Amsterdam campus. The average student success rates are 25,5 % after two years and 65,4 % after three years (figures for last cohorts). About 6 % of the students drop out.

Considerations

The panel is pleased to see the number of incoming students in the programme and regards the influx of students to be both substantial and diverse. The panel suggests using study and laboratory facilities at both campuses to alleviate constraints with regard to student numbers. Although the entry requirements and admission procedures of the programme are adequate, the panel proposes to make the premaster programme more challenging and more selective, to straighten differences in prior knowledge among students.

The curriculum matches the programme intended learning outcomes. The panel appreciates the contents of the curriculum, offering students thorough research-based education in the chemistry discipline. The panel welcomes the specialisations and variants being offered to students. The curriculum is considered by the panel to be well-thought-through and to be coherent. Although the programme maintains contacts with the professional field through external Research projects, PhD positions and guest lecturers from industry, the panel recommends to intensify the relations with the professional field further.

The lecturers in the programme are perceived by the panel to be well-reputed researchers and qualified teachers. The panel regards the lecturers' educational capabilities to be up to standard. The panel greets the positive opinion of students about the lecturers.

The panel regards the educational concept and the study methods of the programme to be appropriate, promoting student-activating learning. The panel suggests to pursue the introduction of new study methods more actively. The number of hours of face-to-face education meets the standards. The study guidance by the track coordinators and study advisor is appropriate. The panel greets the Personal Education Plan to structure individual curricula. The panel considers the programme to be challenging but feasible. The panel regards the student success rates to be somewhat disappointing and suggests to try and improve these.

Assessment of this standard

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

4.3 Standard 3: Student assessment

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

Findings

The examinations and assessments in the programme are governed by the Teaching and Examination Regulations and are in line with the assessment policy documents of both Universities and Faculties. The quality of examinations and assessments are monitored by the University of Amsterdam Faculty-wide Examinations Board. The Board has installed two committees, to ensure the examinations' quality and to detect and sanction fraud and plagiarism. The Examinations Board for this programme is one of the sub-committees of this Faculty-wide Board, and is composed of two members of each of the two Universities.

The examination methods in the courses are, among others, written examinations, written assignments, small-scale projects and presentations. In a number of courses, multiple examinations are scheduled. In case of group products, the programme has taken measures to counter free-riding. All Master research projects are screened for fraud and plagiarism. Screening has been adopted for other written assignments. Approval by the track coordinator and the Examinations Board of students' Personal Education Plans is required, before students may apply for the Master diploma.

The final Master research project is an individual research project, taking up to one year and having the study load of 42 EC to 60 EC. Most projects are conducted at one of the research groups, participating in the programme. Projects may, however, be done outside of the Universities. The project is supervised by supervisors of one of the research groups. Day-to-day supervisors may be PhD students, acting under the responsibility of staff-supervisors. Before the start of the project, the project proposal, duration and supervisor must be approved by the track coordinator and the assigned examiner. At completion of the project, students are to submit the written report and are to present and defend the results. The project is assessed by two staff members, being the supervisor and the second examiner. They use scoring forms for their assessment, which include as assessment criteria project work, written report and oral presentation. The procedures mentioned are similar for the Literature thesis & colloquium.

In the programme, measures have been taken to ensure the validity, reliability and transparency of examinations and assessments. These measures have been listed in the assessment plan of the programme. Measures include draft examinations to be peer-reviewed, the use of test matrices for examinations, assessment criteria for examinations, model answers for students, and the analysis of examinations with deviant grade distributions (pass rates below 50 % or more than 90 %). Course and examination dossiers and samples of Master research projects are reviewed on a regular basis.

Considerations

The panel regards the examination and assessment regulations for the programme to be appropriate.

The panel approves of the examination methods adopted in the programme, noting these to be consistent with the goals and contents of the courses. The panel is positive about measures being taken to counter free-riding and to prevent fraud and plagiarism.

For the Master research projects, students are offered appropriate supervision. The assessment processes for the projects are up to standard as well, including two examiners and the usage of standardised assessment scoring forms. The panel advises to add more extensive written comments on the projects' assessment forms. In addition, the panel suggests to implement rubrics scoring forms for the projects to further increase the reliability of the assessments.

The panel welcomes the assessment plan, specifying the measures to be taken in the programme to ensure the validity, reliability and transparency of examinations and assessments. The panel notes not all of these measures have yet been fully adopted by examiners. The panel is confident this will be done in the near future.

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.
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Findings

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

The panel reviewed the Master research projects of fifteen graduates of the programme with different grades. In the projects, students have to demonstrate to be able to conduct individual research within one of the specialisations of the programme. The average grades of the projects of the last three years are 7.9. The proportion of cum laude is on average 5 % to 15 % of the programme graduates per year. In the period 2012 to 2018, about 50 % of the Research projects lead to scientific publications in international peer-reviewed journals.

Graduates of the programme find suitable positions rather easily. In the recent alumni survey, 77 % of the programme graduates report having found positions within six months after graduation. About 38 % of them pursued PhD trajectories. About 22 % of the graduates found their jobs in commercial research and about 11 % in education.

Considerations

The panel regards the course examinations, which were reviewed by panel members, to be appropriate.

The Master research projects studied by panel members, qualify as academically sound research projects at master level. The quality and level of the projects differed, which was duly reflected in the grades. The panel generally supports the grades awarded to the research projects by the programme examiners. In a few cases, the grades were, however, overrated.

The panel considers the graduates of the programme to have reached the intended learning outcomes and regards these graduates to be well prepared for suitable positions in this domain, both within academia and in industry. The panel proposes to inform students more intensively about non-PhD positions and students' prospects to acquire these positions.

Assessment of this standard

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

5. Overview of assessments

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

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 further align the administrative procedures of the two Universities with respect to the programme.
- To using the study and laboratory facilities at both campuses to alleviate constraints in this respect.
- To make the pre-master programme more selective.
- To intensify the relations with the professional field further.
- To pursue the introduction of new study methods more actively.
- To try and improve the student success rates of the programme.
- To implement rubrics scoring forms for the Master research projects.
- To add more extensive written comments on the Master research projects' assessment forms.
- To prepare students more intensively for non-PhD positions.