

Assessment report
Limited Framework Programme Assessment

Bachelor Chemical Engineering

University of Groningen

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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 Bachelor Chemical Engineering of the University of Groningen. 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, as published on 20 December 2016 (*Staatscourant* nr. 69458).

The mission of the programme is to train chemical engineers in the design of chemical processes and in the relation between process and product design at a basic level. The objective is that graduates possess the relevant knowledge to be able to understand and design industrial processes on a basic level for the production of relatively simple chemical products. The panel considers the objectives of the programme to be very sound and relevant. The panel appreciates the unique profile of the programme, with its focus on product engineering and on combining the emphasis on classical chemical engineering with general natural science. The learning outcomes are coherently formulated around this profile. They are also up to date, fit within relevant international frameworks and meet the academic requirements for a bachelor in the field of chemical engineering.

The programme comprises typical courses on chemical engineering, with natural science courses (chemistry and mathematics) as well as advanced chemistry ones. The first year is combined with the Bachelor in Chemistry. Students follow the same courses, except for the sustainability symposium, which is specifically tailored to Chemical Engineering. The curriculum complies with the intended learning outcomes. There is a proper balance between Chemistry and Chemical Engineering, in line with the profile of the programme. The combined first year is a unique feature.

The content of the curriculum and course materials are up to standard and fit in the profile of the programme. The educational methods are adequate. Although the number of students has been increased, the programme is still capitalizing on its approach with small-scale educational methods. The programme pays attention to the training of academic and practical skills, with special attention to the skills for integration of product and process technology.

The admission requirements and admission procedures of the programme are well elaborated and effective so that the programme complies with Dutch legal standards.

The programme is doable; the dropout is comparable to other programmes although increasing. The system of mentoring and tutoring is beneficial to the feasibility of the programme. First year students get guidance by mentor groups, which provide an introduction into academic education. In later years the students can call upon the academic advisor for guidance in choosing the track or master programme.

The lecturers are highly motivated and well appreciated by the students. Teachers are mainly drafted among researchers from the Engineering and Technology Institute Groningen. Nearly all lecturers have a PhD and are actively involved in research. Many of them have an industrial background. The research of the Institute has been evaluated as very good in the most recent research review. This academic track record clearly benefits the curriculum. Also, the didactical capabilities of the teachers are up-to-standard as demonstrated by the percentage of lecturers with a university teaching qualification. The size of the staff is relatively small but does not compromise the quality of the programme. New staff is currently being recruited.

The examination and assessment policies are adequate. The Board of examiners is functioning corresponding to its formal tasks and takes its responsibility seriously. The Board has adequate procedures in place to ensure the validity and the reliability of assessments, exemplified by the course unit assessment overview and the peer review of assessments. The course unit assessment overviews and assessment matrices of the current courses are well elaborated and satisfactory. The reviewed assignments and tests are up to standard and reflect the desired level.

The panel confirms that the learning outcomes are realized. The panel has reviewed fifteen final theses and concludes that they clearly demonstrate the intended level of the programme. The panel notes room for improvement in enhancing the consistency of the grading of the final thesis, as examiners can now give a different weighing to the items within a category on the assessment form. The panel also recommends having the first and second examiner of the thesis to make independent judgments.

The vast majority of graduates enrol in a Master's degree programme either in Groningen (approximately 75%) or elsewhere, commonly accepted by very prestigious universities. The success of the graduates in the master programme and admission to other universities is also demonstrating the achievement of the learning outcomes.

The panel that conducted the assessment of the Bachelor Chemical Engineering programme of the University of Groningen 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, March 16th, 2019

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

T.T. Lamers MSc
(panel secretary)

2. Assessment process

The evaluation agency Certiked VBI received the request by University of Groningen (UG) to support the limited framework programme assessment process for the Bachelor Chemical Engineering 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 Chemistry and Chemical Engineering convened to discuss the composition of the assessment panel and to draft the list of candidates.

Having conferred with the management of the Bachelor Chemical Engineering programme of the University of Groningen, 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 Chemical Biology and Medicinal Chemistry, School of Chemistry, University of Glasgow, United Kingdom, professor of Molecular Medicinal Chemistry, Utrecht University (panel member);
- Prof. dr. ir. G.B. Marin, professor of Chemical Reaction Engineering, head Laboratory for Chemical Technology, Ghent University (panel member);
- Prof. dr. Valter Castelvetro, Professor in Industrial and Macromolecular Chemistry, University of Pisa (panel member);
- Prof. dr. Leonard Prins, professor of Organic Chemistry, University of Padova (panel member);
- Dr. P. Berben, senior research manager BASF, member leadership team BASF De Meern (panel member);
- A.E.M. Melcherts BSc, student Master Chemical Sciences: Nanomaterials Science, Utrecht University (student member).

On behalf of Certiked, drs. W. Vercouteren served as the process coordinator and T.T. Lamers MSc (independent advisor) as 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 theses of graduates of the programme of the last two complete years. Acting on behalf of the assessment panel, the process

coordinator selected 15 final theses from this list. The grade distribution in the selection was ensured to conform to the grade distribution in the list, sent by the 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 final theses of the programme graduates, these final theses being part of the selection made by the process coordinator.

A number of weeks before the site visit date, the assessment panel chair and the secretary discussed the self-assessment report provided by programme management, the procedures regarding the assessment process and the site visit schedule. 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 discussion 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 final projects 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 10 and 11 January 2019, the panel conducted the site visit on the University of Groningen campus. The site visit schedule was in accordance with the schedule as planned. In separate sessions, the panel was given the opportunity to meet with Faculty Board representatives, programme management, Examination Board representatives, lecturers 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, 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. After correcting these factual inaccuracies, the final report was established by the chair at March 16th, 2019. Subsequently, 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: Chemical Engineering (in Dutch: *Scheikundige Technologie*)

Orientation, level programme: Academic Bachelor

Grade: BSc

Number of credits: 180 EC

Location: Groningen

Mode of study: Full-time (language of instruction: English)

Registration in CROHO: 21PC-56960

Name of institution: University of Groningen

Status of institution: Government-funded University

Institution's 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 mission of the programme is to train chemical engineers in the design of chemical processes and in the relation between process and product design at a basic level. This mission aligns well with the general policy of the Natural Science faculty to strengthen its engineering activities. The objective is that graduates possess the relevant knowledge to be able to understand and design industrial processes on a basic level for the production of relatively simple (i.e. non formulated) chemical products. Moreover, students are trained to integrate the fundamentals of chemistry and engineering to be able to perform a basic process design and are able to effectively communicate their results and design to a CE-educated audience. To preserve the autonomous character of the Bachelor's degree programme and ensure labour market chances for the graduates, also relevant skills (e.g. communication, logical thinking and engineering skills) have been implemented in the learning outcomes.

According to the management, the programme is unique due its focus on product engineering. The programme combines the attention on classical chemical engineering with general natural science and product technology on a basic level. This is reflected by the presence of relatively advanced chemistry elements (organic, inorganic and polymer chemistry) as well as specific chemical engineering (e.g. multi-phase reactors, advanced transport phenomena and process design), constituting a unique feature of the programme. This profile had been adopted in 2003 and has since been applauded by the professional field, which articulates a demand in trained chemical engineers with this profile.

The programme has defined its intended learning outcomes, which consist of general academic skills and specific programme-related knowledge and skills.

The programme shows how the learning outcomes relate to the internationally accepted descriptions for the Bachelor's level, as demonstrated by the Dublin descriptors. Furthermore, the programme shows that the learning goals are based on the Dutch qualification framework formulated by the 'VSNU Kamer Scheikunde' and meet the international requirements specified by the 'EFCE recommendations.' The programme also complies with the general Frame of Reference for Chemistry sciences, a document assembled by representatives of all Chemistry and Chemical Engineering programmes in the Netherlands.

Considerations

The panel considers the objectives of the programme to be very sound and relevant. The panel appreciates the positioning of the programme at the boundary between chemistry and chemical engineering, with a deliberate focus on product engineering. Thus, the programme has a clear vision and a distinguishable profile. The panel has learnt that this profile is supported by the external advisory board of the programme and by industrial contacts.

The panel notices that the programme aims to train chemical engineers professionally, although most of the graduates will continue their studies in a master programme.

According to the panel, the learning outcomes are coherently formulated around the unique profile of the programme. The learning outcomes are also up to date and reflect current developments in the field of chemistry. In this way, students experience the forefront of innovations in the field of chemical engineering.

The intended learning outcomes fit within relevant international frameworks and meet the academic requirements for a bachelor in the field of chemical engineering. This is exemplified by matching the Dublin descriptors for the Bachelor programme, the EFCE recommendations and the Dutch national domain-specific framework.

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 programme comprises typical courses on chemical engineering, with natural science courses (chemistry and mathematics) as well as advanced chemistry ones. The first year is combined with the Bachelor in Chemistry. Students follow the same courses, except for the sustainability symposium, which is specifically tailored to Chemical Engineering. This joint programme gives students the freedom to switch to chemistry and vice versa without a repair programme. In recent years, 14% of the students has made such a switch. In the second year, the content is more focused on the basics of process technology, complemented by Chemistry courses. The third year is characterized by a process design orientation. The programme is completed by an individual research project.

The curriculum provides room for only one elective, although some students are demanding more freedom and a less rigid curriculum, for example to stay abroad. The management is looking how to optimize this and make more room for different study paths and a little more freedom, while also the staff and the external advisory body have asked for more industry-related applications in the first year. This can also have effect on the first year, which will be more CE-specific.

The programme has presented the mapping of the intended learning outcomes with the course units, which demonstrates all learning outcomes are covered.

The programme pays attention to skills. Academic skills are trained throughout the programme and include: critical thinking, literature survey, lifelong learning, engineering skills, communication skills, management skills and experimental skills. These skills are taught in a gradual manner. Ethics and integrity are specifically discussed in the course on Science, Technology and Society. Also special attention is paid to the skills for integration of product and process technology.

The didactic principles of the curriculum are: context-driven learning, activating teaching methods, increasing integration and intensification of content, teamwork in interdisciplinary and intercultural settings, interaction between research and education, clear embedding of academic skills and orientation on the labour market. Teachers informed the panel about practicing new activating instruction styles to enhance class interaction. They also pay attention to group work. Lecturers note that while group composition is voluntarily, national and international students do not stick together anymore and mix more.

Both staff and students regard the programme as feasible. Students told the panel that this requires a considerable amount of effort. They appreciate the approachability and open-door policy of teachers. The drop-out rate has recently fluctuated between approximately 20 and 30% of the incoming students. Drop-out mainly occurs in the first year, but specific 'stumbling stone' courses have not been identified. Teachers indicate that while the first year is selective, it is also a good preparation for, and reflection of, the remainder of the curriculum in terms of intensity and depth. The drop-out is increasing and management is now conducting an analysis of this to be able to act upon.

The programme follows the Dutch national admission requirements to the Bachelor. To generate the right expectations and to advise on enrolment, the programme organizes matching activities, e.g. information on the programme and a mathematics class. This was already done for Dutch students, and is now also extended to international students. The programme has a strong international appeal; for the latest year 75% of the incoming students are non-Dutch.

First year students get guidance by mentor groups, which provide an introduction into academic education. Attendance is compulsory. The mentors are also acting as teaching assistant and doing tutorials in the first-year bachelor courses. In later years the students can call upon the academic advisor for guidance in choosing the track or master programme. Students told the panel they appreciate the mentoring and the guidance by the academic advisor.

Teachers are mainly drafted among researchers from the Engineering and Technology Institute Groningen, while researchers from other groups are drafted for contributions in courses on for example Mathematics. Nearly all lecturers have a PhD and are actively involved in research. According to information of the management, 46% of staff members have an industrial background or have a major affiliation at a company or research institute. Also professionals from the industry are involved as (guest) lecturers. They are especially teaching on generic knowledge of industrial processes. The research of the Institute has been evaluated as very good in the most recent research review.

Most of the staff members (64%) have a university teaching qualification. Staff members who were appointed recently are still enrolled in the course to obtain this qualification. Also teaching assistants are trained on didactical issues.

The core faculty of the programme consists of seven members. According to the management, the student-staff ratio has to be lowered. Measures have been taken to ease the work-load and new staff is currently being recruited. This will result in a student to staff ratio of 35:1 for the academic year 2018-2019, still significantly above the faculty-wide aim of 25:1.

According to the management and teachers, the workload of individual teachers has increased substantially due to the recent rise in bachelor and master student numbers in both the Chemistry and Chemical Engineering programmes. The number of first-years students in this bachelor programme has been multiplied from approximately 20 in 2011 to 80 in 2017. The panel learnt from the discussions that the workload is currently manageable and does not comprise the quality of the programme, but the increase could pose a risk in the near future. Management is aware of the teacher's workload.

Considerations

The panel has established that the curriculum of the programme complies with the intended learning outcomes. The programme is well structured, with a proper balance between Chemistry and Chemical Engineering, in line with the profile of the programme. The panel has reviewed the curriculum and course materials and concludes that they are up to standard and also fit in the profile.

The panel appreciates the concern by the programme to make the training of academic skills more visible (for example on academic writing or presentation). The curriculum provides opportunities for the development of these skills. A tangible learning line would enhance the reflection of students on their learning outcomes.

The combined first year with the Bachelor in Chemistry is a unique feature. The panel advises to maintain this selling point as it is of added value to discussion of topics in the field of Chemical Engineering, as well as helpful to students who want to postpone their study choice.

The panel has however noticed that some courses are also taught to a mixed student population, from other – poorly related – programmes like management studies, and asks for attention as this set-up might compromise the level and depth of the course to students in Chemical Engineering.

The panel finds the educational methods of the programme adequate, promoting student-activating learning, and aligned with the demands of the student population. The methods are based on sound educational principles and put emphasis on integrating skills. Although the number of students has been increased, the programme is still capitalizing on its approach with small-scale educational methods. The accommodation is sufficient to provide the curriculum on this educational basis. The panel has established that the management is aware of any potential effects of the growth of student numbers on the availability of facilities.

The admission requirements and admission procedures of the programme are well elaborated and effective. It makes sure that the programme follows the Dutch legal standards. Based on the interviews with students, the panel has established that their ambition fits with the programme and the information provided by the study programme ensures the right expectations for students.

The panel considers the programme doable; the dropout is comparable to other programmes but increasing. The system of mentoring and tutoring are beneficial to the feasibility of the programme.

The panel regards the lecturers of the programme as highly motivated. Also, students are very positive about their teachers. The teaching staff has a very good academic track record and professional experience, which clearly benefits the curriculum. Also, their didactical capabilities are up-to-standard as demonstrated by the percentage of lecturers with a UTQ. The size of the staff is relatively small, and it is necessary with growing student numbers to have more staff. The panel has learnt this issue has the attention of the faculty board and does not comprise yet the quality of the programme.

Overall, the panel regards the teaching and learning environment as surpassing common levels, in particular regarding the structure and content of the courses, embodying the unique profile of the programme, the combined first year with the Bachelor in Chemistry and its small scale. The panel also appreciates the way the programme responds to students' needs and preferences.

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 has formulated its principles with regard to assessment: different forms of assessment are used, the mode(s) of assessment match the nature of the course unit, the academic skills are all assessed, and the assessment provides feedback to the teachers.

The programme has an assessment plan, which comprises the learning outcomes of the programme, the examiners and modes of assessment of all course units, a list of individual research project supervisors, and a matrix clarifying the relationship between the learning outcomes and the course units of the curriculum.

For each course, a course unit assessment overview is available, which comprises a systematic description of the links between learning outcomes, modes of instruction and modes of assessment and marking, as well as the students' backgrounds and the position of the course unit within the curriculum.

The programme aims to ensure the quality of each test by means of a test matrix and peer review. And as a rule, exams and assignments are always drafted or checked by two lecturers (peer review) to ensure that the exam questions are clear, unambiguous and sufficiently assess whether the various learning outcomes of the course unit have been attained.

The Board of Examiners deals with all four programmes in the field of Chemistry and Chemical Engineering. The Board has intensified its proceedings since the previous audit. Three years ago, also an external member with educational expertise was added to the Board. The Board has taken measures to ensure the quality of the assessment. For example, the Board has set guidelines regarding oral assessment, stipulating that a transcript must be made. The Board annually checks the assessments of a number of course units; each course is checked once in three years. Furthermore, the Board is yearly reviewing a sample of theses. In its latest review, the Board has found that supervisors of theses could elaborate more on the justification of marks on the assessment form; it has asked for attention to this.

Besides, the Board of Examiners has to give its approval to any individual deviation from the structure of the programme and ensures all learning objectives have been met. This especially concerns students who go studying abroad; approval needs to be requested (and granted) beforehand. In addition, the committee conducts an individual check six months before graduation to determine whether all qualifications will be met, so as to avoid any surprises. In case of any deficiencies, this gives the student sufficient time for remedies.

Considerations

The panel considers the examination and assessment policies for the programme as adequate. The Board of examiners is functioning corresponding to its formal tasks and takes its responsibility seriously.

According to the panel, the Board of Examiners has procedures in place to ensure that the validity and reliability of assessments are adequate. This is exemplified by the course unit assessment overview and the peer review of assessments. The panel has reviewed the course unit assessment overviews and assessment matrices of the current courses and finds them well elaborated and satisfactory.

The panel has also reviewed assignments and considers them to be up to standard. The tests clearly reflect the desired level.

The panel observed that some courses are assessed as groupwork. The panel considers this as appropriate and even relevant to the professional future at which engineers need to work together. From the discussions with the staff, the panel has been convinced that the teachers have proper attention for the individual contribution of individual students.

The panel concludes that the assessments are valid, reliable and sufficiently independent. The quality of interim and final examinations is sufficiently safeguarded. The system of assessment properly determines whether students have attained the intended learning outcomes.

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 programme demonstrates the achievement of the learning outcomes by the final theses and the success of graduates in their following study or career.

The final thesis is based on an individual research project. Until two years ago, it was possible to graduate on a groupwork thesis. However, it has been made clear which part was done by which student, to allow the individual assessment. Presently, all theses are works by one individual student. As the programme is at the boundary between Chemistry and Chemical Engineering, the programme regards it as natural that the thesis should also reflect in-depth knowledge of Chemistry.

The programme uses a form for assessment of the thesis. The form comprises a grading scheme, recently expanded with rubrics. Two assessors make the evaluation and fill in the form after debating the examination. If any external supervisor is involved, he or she has only an advisory role and can give written comments, while the final decision and the grading is done by the examiner of the programme.

The vast majority of graduates enrol in a Master's degree programme either in Groningen (approximately 75%) or at another (foreign) university. According to the programme management, students leaving for a master's degree programme elsewhere are commonly accepted by very prestigious universities (e.g. Imperial College London, Technical University of Singapore). A small fraction of the graduates however (mostly non-European students) are going to work first, before considering entering a master programme.

Considerations

The panel has reviewed fifteen recent final projects and determines that they all clearly demonstrate the intended level of the programme. The panel evaluates these theses as very solid and they show both good theoretical reasoning and experimental work. Some of the theses have quite some emphasis on Chemistry rather than on Chemical Engineering, but this is in line with the profile of the programme.

The panel has concluded that the assessment forms are completed. Assessors use the same form, with a fixed weight for the different categories of assessment. The panel has noticed room for improvement in the accumulation of the different items within the categories. Apparently, different examiners can give different weights to the items within a category on the assessment form. The panel recommends improving the consistency of this.

In addition, the panel recommends that the first and second examiners make independent judgments, by each filling in an assessment form before debating the final grading. This increases the effect of the four eyes principle.

Furthermore, the panel considers the achievement of the intended learning outcomes as demonstrated by the success of the graduates in the master programme.

The panel however recommends the programme management to get more data on the career paths of alumni.

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 maintain the combined first year with the Bachelor in Chemistry.
- To make sure that combined classes (in which also students from outside chemistry or chemical engineering participate) do not compromise the depth of courses for students in Chemical Engineering.
- To improve the consistency of the grading of the final thesis, as examiners can now give different weights to the items within the assessment form.
- To have the first and second examiner of the final thesis make independent judgments, by each filling in an assessment form prior to debating the final grading.
- To gather more data on the career paths of alumni.