



ASSESSMENT REPORT

Extensive programme assessment

hbo-bachelor programme
Chemical Engineering | Process & Food
Technology
fulltime

The Hague University of Applied Sciences

De kracht van
kennis.

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CROHO No. 34275

Hobéon Certificering

Date

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Panel

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1. GENERAL DATA

Name of institution	The Hague University of Applied Sciences
Legal status of institution	Funded
Outcomes of Institutional Quality Assessment	Not applicable
Name of degree programme as it appears in CROHO	Bachelor Chemical Engineering: Process and Food Technology
ISAT-code CROHO	34275
Domain/sector	Technology
Orientation	Professional (hbo)
Level	Bachelor
Degree and title	Bachelor of Science (BSc)
Number of credits	240 EC (or 180 EC)
Specialisations (graduation options)	Chemical Process Technology Food Process Technology
Location	The Hague
Variants	Four-year track (PFT4, 240 EC) Three-year track (PFT3, 180 EC)
Joint programme	Not applicable
Language of instruction	English
Date of site-visit	29 November 2018

2. SUMMARY

The Bachelor Process & Food Technology is a professional bachelor's programme in the domain of chemical engineering. It is offered by the Faculty of Technology, Innovation and Society (TIS); one of the faculties of The Hague University of Applied Sciences. The Bachelor PFT prepares students for careers in the chemical and food industry as specialists in the field of process technology.

The course typically focusses on process optimisation. It has an international orientation and a practical approach. The student group is relatively small and diverse, representing a wide range of nationalities.

Both a three-year track (180 EC) and a four-year track (240 EC) of the programme PFT are offered. The two variants are almost identical, their difference being that students in the three-year track have a higher work pace. Because the two variants are identical content wise in nearly all aspects, the panel's findings, judgements and conclusions will concern both. Furthermore, PFT offers two specialisations, scheduled in the last three semesters, named Chemical Process Technology and Food Process Technology.

Theme 1; Intended learning outcomes

The quality of the intended learning outcomes is appropriate. The deployment of the DAS competences ascertains the applicable (hbo)level, an international reference to the technology domain and the topicality of the intended learning outcomes. Research is well integrated in the competences. The programme's own Advisory Board plays an active role in the evaluation and development of the learning outcomes. Two additional learning outcomes furnish the specific PFT course profile, one focussing on student's international capabilities and the other one featuring student's social responsibility. In terms of content and title, the programme distinguishes itself from other Chemical Engineering programmes by its emphasis on process technology in the food industry. The panel however, established that material sciences is also broadly represented in the programme and the graduation theses. The panel suggests that the programme reflects on its title to determine to what degree it sufficiently and transparently covers the content of the programme.

Based on these findings, the panel rates standard 1 as **'satisfactory'**.

Theme 2; Curriculum

The panel concludes that the PFT programme offers students sufficient room to develop their professional and research skills, thus accomplishing a generic level of quality for this standard. The panel appreciates how the programme emphatically connects its students with the professional field through projects, workshops, company visits, guest lectures and internships. The curriculum also offers students the opportunity to develop their professional research skills, although the integration of knowledge and skills in research projects could be further enhanced (for example, through a strong connection with a research group).

The panel considers Standard 2 to be **'satisfactory'**.

In weighing up the strong and weak points, the panel concludes that the PFT programme accomplishes generic quality for standard 3. Each of the learning outcomes has been adequately translated into a number of indicators. The content of the curriculum appropriately relates to these competencies and indicators. The panel is positive about the clear and solid knowledge base of the programme and the coherence between the various modules, blocks and years. Content wise, PFT could give more substance to internationalisation. The panel rates Standard 3 as **'satisfactory'**.

The panel is very positive about the deployment of a broad variety of didactic formats, which evidently contribute to achieving the intended learning outcomes. Likewise, the panel is pleased with the opportunities that PFT offers its students to focus on their own interests and ambitions. Furthermore, the panel appreciates the design of the fast track curriculum, the feasibility of it and the coaching of these fast track students. The neat way in which the design of the learning environment chimes with the educational vision of The Hague University of Applied Sciences, is also a strong feature of the programme. Therefore, the panel deems standard 4 to be **'good'**.

The programme has set out clear admission requirements in its Programme and Examination Regulations. These also concern students eligible for the fast track. Students who do not meet the English language requirements can, in some cases, eliminate deficiencies through English Prep-School. In general, the bachelor of PFT ties in with the prior education of the students, although the work field representatives observe quite a difference between students' (entrance) levels. The programme should monitor the entrance levels in relation to the students' study performances/results more thoroughly. Taking all of the above into consideration, the panel deems Standard 5 to be **'satisfactory'**.

Theme 3; Staff

The staff is well equipped and highly educated in terms of domain-specific and research expertise. The panel determined that the international composition of the staff truly contributes to creating an international and multicultural learning environment, which strongly benefits the achievement of the learning outcome on internationalisation. The panel also appreciates the involvement of the staff with their students. It highly values the course professionalisation plan and the faculty's eagerness to stay in tune with new developments. The lecturers are a real team, working and learning together. The panel considers Standard 6 to be **'good'**.

Theme 4; Facilities and tutoring

The panel has established that the general facilities reflect generic quality. The facilities feature several labs covering most aspects of food design, characterisation and technologies. The panel believes that these laboratories and the available equipment contribute to an adequate execution of the curriculum, that includes quite a number of lab workshops and projects. The panel believes that the set-up of a microbiological lab within THUAS would be a nice asset. In general, the panel agrees with the students that the facilities sufficiently enable students to achieve the learning outcomes of the programme. The panel considers Standard 7 to be **'satisfactory'**.

The panel welcomes the digital environment and the availability and transparency of the block books, although the alignment between competencies and (block) indicators could be improved. Despite PFT's open-door policy is one of its prominent assets ensuring a lot of (informal) contact between teachers and students, the panel thinks it is advisable to tailor the formal mentoring and the supervision during internships to the needs of the student, without creating too large differences in supervision intensity.

The panel appreciates the programme's supportive attitude towards students, but also identified some points for improvement. Therefore, the panel rates Standard 8 as **'satisfactory'**.

Theme 5; Quality assurance

The panel concludes that the PFT programme has an adequate quality assurance system in place, thus achieving the generic level of quality for standard 9. The panel notes that the programme utilises different evaluation instruments to gain feedback from the various stakeholders. The management takes feedback seriously and discusses issues that come up in evaluations with the team, leading to effective improvement plans. The conclusive step to be

taken is to inform stakeholders on intended and executed actions. The panel considers Standard 9 to be **'satisfactory'**.

Theme 6; Student assessment

The panel is pleased with the assessment system of the course. All assessments include clear instructions and relevant questions related to the context and are challenging to the right degree. PFT's assessment policy contributes to the reliability, transparency and validity of assessments. The panel finds the assessment matrices useful. Still, the Over-All-Tests require attention with regard to the weighing of the substantive topics within these tests.

In general, the panel is satisfied with the performance of the Exam Board. Its members have the adequate qualifications for their tasks. The panel considers it advisable to facilitate the Exam Board to make them more confident about dealing with the Modern Migration Act. The panel considers the graduation process and its assessment procedures adequate.

Taking into consideration the positive observations and the points for improvement, the panel considers Standard 10 to be **'satisfactory'**.

Theme 7; Achieved learning outcomes

The panel concludes that the overall quality of the achieved learning outcomes is sufficient. The theses from the 2016-2017 cohort were at basic bachelor level, but the most recent theses demonstrated that the implemented improvements with regard to writing skills, the approval of the proposal and coaching had truly payed off and resulted in much better research designs and reports. Furthermore, from the alumni's perspective the programme fits the demands of the labour market, which was confirmed by the professional field representatives in the audit.

Taking into consideration all of the above, the panel considers Standard 11 to be **'satisfactory'**.

General conclusion:

The Bachelor Process & Food Technology of The Hague University of Applied Sciences is a study programme that is positively valued by its students and alumni. The panel recommends that the programme further aligns the name and the content of the programme and strengthen the integration of knowledge and skills in research projects. Based on the NVAO judgement and assessment rules, the panel arrives at a general judgement of **'satisfactory'** for both specialisations and the regular and fast track of the programme.

The panel advises the NVAO to accredit the Bachelor in Process & Food Technology of The Hague University of Applied Sciences for another six years.

Upon agreement with the panel members the chair in The Hague adopted this report on 30 April 2019.

3. INTRODUCTION

The Bachelor Process & Food Technology is a professional Bachelor's programme in the domain of chemical engineering. It is offered by the Faculty of Technology, Innovation and Society (TIS); one of the seven faculties of The Hague University of Applied Sciences. The Bachelor PFT prepares students for careers in the chemical and food industry as specialists in the field of process technology.

The course typically focusses on process optimisation. It has an international orientation and a practical approach. The student group is diverse and relatively small, representing a wide range of nationalities.

Both a three-year track (180 EC) and a four-year track (240 EC) of the programme PFT are offered. The two variants are almost identical, their difference being that students in the three-year track have a higher entrance level (VWO) when entering the programme and they study in a compressed programme and therefore have a higher work pace. Because the two variants are identical content wise in nearly all aspects, the panel's findings will include both of them. Furthermore, THUAS offers two specialisations, scheduled in the third year, named Chemical Process Technology and Food Process Technology.

The visitation of the Bachelor PFT is part of a series of audits that is carried out among programmes in the visitation cluster 'Life Science & Technology'. The other universities of applied sciences in this cluster are NHL Hogeschool, Hogeschool Utrecht, Hogeschool Inholland and Hogeschool Van Hall Larenstein. The audits of this cluster took place between October 2018 and December 2018. The panel used the Extensive Assessment Framework of the Dutch-Flemish Accreditation Organisation NVAO¹ as its guideline for the audit.

Previous accreditation and follow-up

The Bachelor PFT was previously accredited in 2010. Back then the panel was pleased with the quality of the programme. It addressed a few minor issues, namely (1) that more attention should be given to the information services for aspects like scheduling and publication of test and assessment marks, as well as study career counselling, and (2) it recommended to update the quality assurance system.

The panel established that the programme adequately responded to the points of improvement that had arisen from the 2010 audit. The evaluation instruments have been extended and feedback is taken seriously. Also, the digital learning environment has been updated and students are now satisfied with the way information is provided.

¹ Assessment Framework for the Higher Education Accreditation System of the Netherlands, 2016.

4. PANEL JUDGEMENTS ON STANDARDS

4.1. Intended learning outcomes

Standard 1: 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.

NVAO's explanation: The intended learning outcomes demonstrably describe the level of the programme (Associate Degree, Bachelors, or Masters) as defined in the Dutch qualifications framework, as well as its orientation (professional or academic). In addition, they tie in with the regional, national or international perspective of the requirements currently set by the professional field and the discipline with regard to the contents of the programme. Insofar as is applicable, the intended learning outcomes are in accordance with relevant legislation and regulations. The points of departure for the set-up of the programme chime with the educational philosophy and the profile of the institution. The intended learning outcomes are periodically evaluated.

Findings

Competences

The intended learning outcomes of the Bachelor in Process & Food Technology of THUAS are derived from the national competency profile of the DAS². All universities of applied sciences (UAS) offering programmes in the domain of applied science are gathered in the DAS. In the Netherlands for seven out of nine educational programmes within DAS a national competency profile has been drawn up. The intended learning outcomes were developed and are reviewed in consultation with the professional field. National and international developments in the professional field have been incorporated into the profile design and an international benchmark has been executed. The panel also notes that the intended learning outcomes clearly reflect Bachelor's level as indicated by the Dutch Qualifications Framework (NLQF). This national competency profile for Chemical Engineering is at the heart of the PFT programme. The topicality of the intended learning outcomes is regularly reviewed, both in a professional field consultation at the national level as well as by the Advisory Board of PFT.

In addition to the eight nationally agreed competencies, PFT has formulated two additional competences. This concerns 'social responsibility' and 'functioning in an international environment'. The competencies have been further specified on three levels of command. In all, this means that the PFT students must acquire the following competences:

No.	Origin	Competency	Level
1	DAS	Research	2 or 3*
2	DAS	Experimentation	2
3	DAS	Development	2 or 3*
4	DAS	Management and coordination	1
5	DAS	Advice, procurement and sales	1
6	DAS	Instruction and coaching	1
7	DAS	Leadership	1
8	DAS	Self-management	2
9	THUAS	Social responsibility	2
10	THUAS	Functioning in an international environment	2

² Domain Applied Science

* At least one of these competences must be achieved at level 3

This competency profile applies to all tracks and specialisations of the programme. Students can choose for themselves if they want to either achieve the research competency or the development competency at level 3.

Profile

All (government-funded) Dutch Chemical Engineering programmes use the competences from the national profile. Nevertheless, every university of applied sciences can add its own 'flavour'. To this end, the Hague University of Applied Sciences has added two competences, namely 'social responsibility' and 'functioning in an international environment'. The panel notes that these two competences are in line with the ambition of THUAS to encourage students, lecturers and partners to become world citizens. In particular, the international nature of the training is distinctive: the programme is completely in English, has students from more than 10 countries and 50% of the staff is of foreign origin.

On the other hand, the focus of the curriculum also characterises the programme. All other universities use the name Chemical Engineering as title for their programme, whereas the Hague University of Applied Sciences decided to name it Process & Food Technology, because of its emphasis on both Chemical Process Technology and Food Process Technology, which are two specialisations students can opt for. According to THUAS, the focus on Food Process Technology attracts a broader group of students and, moreover, attracts more women. The panel understands the considerations of THUAS with regard to the name of the programme. On the other hand, the panel established that the graduation reports demonstrate a tendency towards material sciences, which is also an upcoming theme in the professional field. Also, in the curriculum the panel perceived substantial attention for materials and plastics. When studying Process & Food Technology, one would not naturally think of (broad) material sciences. The panel therefore suggests PFT to reconsider the title of the programme, taking into account the broad scope of the theses and the content of the programme, which are suitable for a Chemical Engineering programme, but more diverse than Process & Food Technology.

Research

Where the international orientation of the programme is covered in the use of the DAS competencies, both competency 1 and 2 feature explicit elements of research. These competencies imply analysis, setting goals, literature search and referencing, understanding methods, being able to use equipment, presenting results, drawing conclusions and giving recommendations.

Considerations and judgement

The quality of the intended learning outcomes is appropriate. The deployment of the DAS competences ascertains the applicable (hbo)level, an international reference to the technology domain and the topicality of the intended learning outcomes. Research is well integrated in the competences. The programme's own Advisory Board plays an active role in the evaluation and development of the learning outcomes. Two additional learning outcomes furnish the specific PFT course profile, one focussing on student's international capabilities and the other one featuring student's social responsibility. In terms of content and title, the programme distinguishes itself from other Chemical Engineering programmes by its emphasis on process technology in the food industry. The panel however, established that material sciences is also broadly represented in the programme and the graduation theses. The panel suggests that the programme reflects on its title to determine to what degree it sufficiently and transparently covers the content of the programme.

Based on these findings, the panel rates standard 1 as '**satisfactory**'.

4.2. Curriculum

Standard 2 (orientation): The curriculum enables the students to master appropriate (professional or academic) research and professional skills.

NVAO's explanation: The curriculum ties in with current (international) developments, requirements and expectations in the professional field and the discipline. Academic skills and/or research skills and/or professional competencies are substantiated in a manner befitting the orientation and level of the programme.

Findings

Professional skills

The panel perceived that the programme maintains a strong relationship with the professional field. Not only is the professional field involved in the development of the curriculum, it also takes part in the execution and evaluation of the curriculum. Just like other field representatives, the members of the Advisory Board are regularly guest lecturers or clients. In addition, students frequently visit, among others, companies and organisations of members of the Advisory Board.

The panel also spoke with a PFT alumnus, who has established his own beer brewery. As a visiting lecturer he is involved in the first year block (1.4) about organic products, in which students have to produce their own beer. And during the site visit the panel saw the food lab, where a professional cheesemaker was teaching a group of students how to make their own cheese. Excursions are also part of the curriculum. The deployment of guest speakers and company visits ensures that the programme keeps up with new developments in the food and process technology markets, as students argued.

The professional orientation of the programme becomes also visible in the projects. These projects focus on professional practice and often have an external client. For example, Croda is the client in a project about the biogas production from glycerine water (block 2.3). And as a result of an earlier evaluation of the very first block about water treatment, the programme attracted a new client. This new client is a start-up company using a new technique for water purification. The results of the student projects are discussed and evaluated afterwards with representatives from the professional field.

The internship in year 3 and the graduation internship in year 4 also take place in the professional field. In recent years, students have completed their (graduation) internship at well-established companies in the field of FMCG³, such as Friesland Campina, TATA Steel, Arla Foods and DuPont.

Research

Through lab work, projects and workshops, PFT enables students to also develop the required skills. For example, starting in the first block, students develop their general laboratory skills, related to the competences research and experimentation.

In the context of this programme, to a larger extent research takes place in the labs. The development of chemical-technological research skills takes place via experimental lab work. The writing of research proposals, the literature search and the preparation of a research report is discussed in flanking communication education.

³ FMCG: Fast moving consumer goods

From the beginning of the study, according to the panel all projects contain a research component. During projects in minors, internships and specialisations, students work, among others, on assignments in cooperation with research groups from TU Delft, Sensus, Tebodin and Unilever. Groups of students also carry out assignments for the THUAS research groups on Urban Metabolism and Technology for Health. For example, the panel saw a graduation project concerning artificial muscles, a theme that is related to the Technology for Health research group.

The self-evaluation and the interviews bear witness that regional companies from small and medium-sized enterprises regularly come up with research questions. These projects often take place in the specialisation phase. For example, the small brewery Crooked Spider invited students to come up with new ideas for the application of brewers spent grain.

In addition, students can choose to follow a premaster at a university as a minor (15 EC), to orient themselves on or prepare themselves for a master's programme at a university.

The panel took notice of some very interesting research projects. At the same time the panel believes that students' learning about research and methodology and the (real life) projects in which they have to apply their research knowledge and skills, could be more structurally integrated. As research and experimentation are important competencies of PFT, it would be of great value for the PFT to have a research group that is structurally and intensively linked to the programme. Although the panel realises that it is not possible to 'just' set up a research group, it would advise PFT – that is currently working on a redesign of its curriculum – to pay extra attention to the integration of research knowledge and skills into through real life research projects. The panel would suggest to conduct these research projects under the guidance of a research group.

Considerations and judgement

The panel concludes that the PFT programme offers students sufficient room to develop their professional and research skills, thus accomplishing a generic level of quality for this standard. The panel appreciates how the programme emphatically connects its students with the professional field through projects, workshops, company visits, guest lectures and internships. The curriculum also offers students the opportunity to develop their professional research skills, although the integration of knowledge and skills in research projects could be further enhanced, for example, through a strong and structural connection with a research group.

Weighing up all of the above, the panel considers Standard 2 to be **'satisfactory'**.

Standard 3 (content): The contents of the curriculum enable students to achieve the intended learning outcomes.

NVAO's explanation: The learning outcomes have been adequately translated into educational objectives of (components of) the curriculum.

Findings

Degree to which proposed learning outcomes are covered

A number of indicators for each of the ten programme competencies was drawn up to give direction to the curriculum and assessments. For example, nine indicators are linked to the 'Experimentation' competency, including the understanding of various experimental methods, the ability to handle equipment, accurate and safe working and measurements. The programme has presented to the panel an overview that shows which indicators / competences are addressed in which module, and at what level.

A review of the curriculum taught the panel that the course contents relate appropriately to the competencies and indicators that were drawn up. The Safety indicator, for example, is featured in the Food Products section of block 1.2, which deals among other things with food safety. It returns during block 2.1, which is about Risk Management, and during the course Responsible Operations (block 2.3) and, again, in block 4.1 about Health & Safety.

The panel compared the Body of Knowledge and Skills, as established in the DAS context, with the curriculum of the Process Food & Technology course and it concluded that the knowledge and skills from the BOKS are reflected in the curriculum. For example, knowledge on materials science is dealt with in block 1.3 and 2.2 and knowledge about physical transport phenomena is discussed in blocks 1.1, 1.3, 1.4, 2.2, 2.3, 3.4 and also in the specialisations.

Cohesion

In the Self-Evaluation Report, PFT explains various ways in which it ensures the coherence of the curriculum. First of all, the programme is made up of different phases (propaedeutic phase, main phase, specialisation phase), and over the years, students have to demonstrate to master the competences at an ever-increasing level of complexity as can be gathered from the consecutive courses over the years.

Another way in which the course ensures coherence is through block themes. Each block has a central project that is related to the block theme. The theoretical courses, the practical courses and the company visits are supportive for the execution of the project. The block themes also show a logical sequence, illustrated in a block about food products in year 1 and a block about food processing in year 2. Or a block about risk management at the start of year 2 and a block about 'Responsible operations' further on that year. The blocks and projects also alternate between food technology and chemical technology processes. As a result, the students are sufficiently prepared to make a choice for one of these specialisations in year three or four.

Additionally, the students with whom the panel conversed agreed that the programme is cohesive, that it meets their expectations and that they are generally satisfied. Students indicated that the difficulty of the projects continues to increase. And the theory about polymers, for example, is being built up over the years. The same applies to Reaction Kinetics & Engineering that is discussed in a block every year and has an increasing complexity. The panel agrees that, in broad lines, the programme is coherent, yet it would recommend seeking even more integration between theory and projects (see Standard 2). The management said that they were already working on this, in the context of the curriculum renewal.

Elements of internationalisation

The panel observed that the international student body offers a rich international learning environment and a great benefit to the course. PFT, among others, currently has students from Brazil, South Korea, Switzerland, Indonesia, Latvia, Spain and China. Already in block 1 there is the start of 'the international classroom'. Bringing together different nationalities in a project group means that students (unconsciously) work on their intercultural communication skills. The panel is convinced that this explicitly contributes to the competence 'functioning in an international environment'. Because many companies in chemical engineering operate internationally and / or have an international workforce, the students get well prepared for work in an international environment. Moreover, the students in the second year follow the course 'Communication Across Cultures', in which they explicitly learn to deal with cultural differences. Students also receive English classes in the first year and foreign students can opt for Dutch classes (elective).

PFT also ensures that students can gain international experience through foreign (graduation) internships. Although it is not compulsory, the programme encourages Dutch students to do their internships abroad or at least at an international company. The programme also advises foreign students not to do their internship in their home countries, in order to meet the intercultural challenges and to enhance their competencies in this area. PFT has a substantial international network. This is confirmed by the students with whom the panel spoke. For example, a Chinese student has recently done an internship in Ghana and a Latvian student has been to Ethiopia for her studies.

THUAS has appointed a number of focus countries/areas. These are Brazil, China, Indonesia and Europe. That is why in these countries, agents of THUAS are located to recruit students for THUAS's programmes and to uphold cooperation with educational and professional partners in these countries.

The panel observed that within the course the element of internationalisation appears to be a matter of course, particularly fuelled by an international body of students and lecturers, but to a lesser extent supported by the content of the curriculum. Therefore, the panel sees opportunities to further improve (and distinguish) the programme when it comes to internationalisation. The panel believes that cultural aspects, such as doing business abroad, laws and legislation, etc. could be enhanced within the curriculum so as to further reinforce PFT's international profile.

Considerations and judgement

In weighing up the strong and weak points, the panel concludes that the PFT programme accomplishes generic quality for standard 3. Each of the learning outcomes has been adequately translated into a number of indicators. The content of the curriculum appropriately relates to these competencies and indicators. The panel is positive about the clear and solid knowledge base of the programme and the coherence between the various modules, blocks and years. Content wise, PFT could give more body to content part of the programme concerning internationalisation.

Taking into consideration all of the above, the panel considers Standard 3 to be '**satisfactory**'.

Standard 4 (learning environment): The structure of the curriculum encourages study and enables students to achieve the intended learning outcomes.

NVAO's explanation: The curriculum is designed in a manner conducive to the achievement of the intended learning outcomes. The teaching-learning environment encourages students to play an active role in the design of their own learning process (student centred approach). The design of the learning environment chimes with the educational philosophy of the institution.

Findings

In its Self-Evaluation Report PFT indicates five educational starting points for the design and didactics of the programme:

1. Students develop competencies by working with a multi-disciplinary approach on professional tasks; knowledge & skills are applied in this process. There is a strong connection between knowledge development and competency growth, with a focus on think and act methodically.
2. Student centred approach where students are active in solving problems, doing research and experimenting, can work in their own pace, and can choose for some part their own curriculum and literature to align with their personal interests and ambitions.
3. Students meet the professional practice right from the start when working on professional tasks with professionals from companies and organizations.
4. Students function in an international and multicultural environment.
5. Students learn how to increase the degree of self-guidance.

Source: *Self-Evaluation Report, Process & Food Technology, THUAS 2018, p.12*

The discussions on-site and the study of further documentation, made it clear that the basic principles are indeed reflected in the design of the programme. The programme is set up in a competence-based way.

The curriculum consists of four quarters (blocks) per year. In the first two years of the regular study programme, a theme is linked to each block. To this end, in every block the programme works with a practical project assignment, which is supported by knowledge-based lectures, skills-oriented practical courses, workshops and individual assignments. The panel assessed that the program works in an integral manner on competence development. Project groups always consist of students of different nationalities. This reflects the international character of the professional field and stimulates the development of intercultural communication skills.

In the first two years students have to choose several electives for 1 credit each. For example, students with high scores for the English assessment test are allowed to enrol for the elective Cambridge Advanced English. International students have the opportunity to study Dutch as an elective. Students can also choose an elective in the field of biology, physics or technology. At the beginning of the third year, students follow an in-depth or broadening minor. PFT itself offers four minors. This concerns Biotechnology (developed in cooperation with DSM and TU Delft), Food Product Design (developed in cooperation with Nutrition & Dietetics and Industrial Design Engineering), Development Cooperation and Micro Technology (in collaboration with Applied Physics, starts spring 2019). Besides these minors, students can also choose another minor or a minor at another institution. It is also possible to follow (a part of) a premaster programme at a (research) university.

Students have to do an internship during the second and third block of the third year. They can choose between an internship of 20 weeks or two internships of 10 weeks. The students can choose their own internship company, provided it meets the requirements of the programme. PFT itself also has a network that students can use in their search for an internship. From the last block of the third year, students follow a specialisation, which is continued in the fourth year. They can choose between the specialisations Food Process Technology and Chemical Process Technology.

Year	Block 1	2	3	4
1	Water treatment	Food products	Inorganic products	Organic products
	Water treatment & Food products	Food processing	Inorganic products & Polymer science	Organic products & Polymer technology
2	Risk management	Food processing	Responsible operations	Polymer Science & technology
	Minor	Internship	Responsible operations	Specialisation
3	Minor	Internship	Internship	Specialisation
	Specialisation & Lint-minor	Specialisation & Lint-minor	Graduation	Graduation
4	Specialisation & Lint-minor	Specialisation & Lint-minor	Graduation	Graduation

Figure 1. PFT programme outline PFT3 and PFT4 (Source: Self Evaluation Report PFT)

The students are very pleased with the options the programme offers them. One of the students told the panel that she wanted to enrol in this study because of her ambition to eventually start her own chocolate factory. At the end of the second year she was able to design her own project and so she opted for a project that focused on chocolate production. This illustrates the scope that the programme - outside the electives, minors, specialisation and internships - offers to students to make their own choices, suiting their interests and ambitions, but still in tune with the intended learning outcomes.

The students also say the programme is doable. This goes for the fast track students as well, although they said that proper time management skills are a prerequisite. Students who meet the requirements to embark on the fast track, already follow some blocks from the second year in their first year (see figure 1). This allows them to finish their study in three years instead of four. The panel spoke with some students who were following the accelerated programme. The fast track class consists of fewer students than the regular classes. Therefore, students get more individual attention, allowing them to digest the study material more quickly. Also, it is beneficial for them that their entrance level is higher (VWO).

The panel thinks that the way in which the course has been designed didactically, is very appropriate for the realisation of the intended learning outcomes and is in line with the educational vision of The Hague University of Applied Sciences, which aims to ensure that programmes provide (i) stimulating, challenging and feasible education, (ii) strive for inclusiveness and (iii) educate students to become world citizens.

Study progress

According to the panel, the performance figures for the PFT programme do not differ from those of comparable programmes in the Netherlands. The mentor plays an important role in monitoring student progress and supporting the student if problems arise. From the first day on every student has a mentor with whom he meets twice a year to discuss his study progress. However, the student comes into contact with his mentor much more often, because (s)he is in many cases also a lecturer and project supervisor. The student can always consult his mentor if he has questions regarding his studies or otherwise. This does not only apply to the mentor, but to all teachers, the students confirm. During the course Study Career Coaching, which is positioned in the first two years of the programme, students develop their time management and study skills.

Students with special needs

Chapter 8.1 of the Programme and Examination Regulations provides information on 'facilities for students with a disability'. It explains that students with a disability who wish to exercise their right for adapted facilities need to submit a request to the Exam Board. If accepted, the facilities will be adapted within 15 working days.

Adaptations to facilities may for instance be related to (a) the access to buildings, (b) the educational programme, including work placements, (c) study timetables, (d) the teaching and supervision methods, (e) educational materials, and (f) tests. Students with dyslexia may also apply for special facilities.

Considerations and judgement

The panel is very positive about the deployment of a broad variety of didactic formats, which evidently contribute to achieving the intended learning outcomes. Likewise, the panel is pleased with the opportunities that PFT offers its students to focus on their own interest and ambitions. Furthermore, the panel appreciates the design of the fast track curriculum, the feasibility of it and the coaching of these fast track students. The neat way in which the design of the learning environment chimes with the educational vision of The Hague University of Applied Sciences, is also a strong feature of the programme. Therefore, the panel deems standard 4 to be **'good'**.

Standard 5 (intake): The curriculum ties in with the qualifications of the incoming students.

NVAO's explanation: The admission requirements in place are realistic with a view to the intended learning outcomes.

Findings

As mentioned in the Programme and Examination Regulations of PFT, Dutch students who want to study PFT must have a HAVO or VWO diploma with NT or NG profile or a relevant MBO4 certificate. Students with a VWO diploma are eligible for the accelerated PFT3 programme of 180 EC. As the course is taught in English, it also allows foreign students to enrol. Their diplomas need to be officially recognised in the Netherlands as equivalent to a relevant Dutch degree. This is done by Nuffic.

Most foreign students have to take an English language proficiency test (IELTS 6.0/TOEFL 80). The panel spoke with students from, among others, China and Indonesia, who were obliged to take the IELTS test prior to admission. Students that do not meet the required language proficiency can be enrolled after having successfully completed remedial training at the THUAS English Prep-School. This English Prep School course will take six months to a year.

From the meetings with students and the assignments and reports the panel reviewed, it became clear that students' command of English varies. Some students master the English language perfectly. Some other students seem to have difficulty speaking and writing in well-structured English. Although the minimum entrance scores for English are set nationally, the panel would suggest the programme to intensify the English language course for deficient students. The same would apply for students who have passed the TOEFL or IELTS assessment, but still have difficulties with the English language.

On the basis of the documentation and the discussions with students and teachers the panel concludes that there are no major differences in educational backgrounds of students (based on the admission by Nuffic). The professional field representatives, however, told the panel they observe quite a difference in (entrance) level between the various students. The panel advises the management to discuss these observations with the work field representatives/the Advisory Board. Monitoring the performance of (Dutch and foreign) students, and relating this to their prior education, may reveal correlations. The panel could imagine this to lead to adaptation of the admission requirements or expansion of the supply/necessity of prep-courses (remedial teaching).

Recruitment

In 2015 there was one excessive intake. In general the intake is between 60 and 70 students per year for the four-year programme and around 15 for the three-year programme.

In general, Dutch students contact the PFT programme through information sessions at secondary schools and open days. International students learn about the programme, among other things, through a search on the internet. In a number of countries - including Brazil, China and Indonesia - the Hague University of Applied Sciences also has agents that play an important role in the recruitment of students. A number of students told the panel that it was indeed an agent who drew the attention to PFT of THUAS. Alumni are also asked to give presentations in their own country or to attend an international student fair. The programme intends to increase recruitment abroad, especially in the focus countries of THUAS.

Exemptions

As mentioned in the PER 2018-2019, students may apply for exemptions based on prior acquired competencies. However, the chairman of the Exam Board told the panel that virtually no exemptions are being requested by PFT students.

Moreover, the policy is that no exemptions are granted for projects because these are strongly related to the development and testing of competencies. However, exemptions are granted for the minor courses. In the case of a request for an exemption, the Exam Board always first asks input from the team leader about the level and content of a module. The Exam Board then checks whether the obtained competencies are correct as indicated by the programme. The Exam Board itself is of the opinion that the exemption policy is not always clear. Consequently, the Exam Board considers the clarification and review of the exemption policy as one of its top priorities.

The requirements for admission to the fast track are very clear to Dutch students (VWO). The eligibility for admission to the fast track of foreign students depends on the advice of Nuffic and the THUAS Admission Board.

Considerations and judgement

The programme has clear admission regulations set out in its Programme and Examination Regulations. This also applies to students eligible for the fast track. Students who do not meet the English language requirements can, in some cases, eliminate deficiencies through English Prep-School. In general, the bachelor of PFT ties in with the prior education of the students, although the work field representatives observe quite a difference between students' (entrance) levels. The programme should monitor the entrance levels in relation to the students' study performances/results more thoroughly.

Taking all of the above into consideration, the panel deems Standard 5 to be **'satisfactory'**.

4.3. Staff

Standard 6: The staff team is qualified for the realisation of the curriculum in terms of content and educational expertise. The team size is sufficient.

NVAO's explanation: The teachers have sufficient expertise in terms of both subject matter and teaching methods to teach the programme. The staff policy is conducive in this respect. Sufficient staff is available to teach the programme and tutor the students.

Findings

Qualifications

Based on the lecturers' CVs and the discussions with lecturers in the site visit, the panel is convinced that PFT faculty is very well equipped in terms of their domain-specific and research expertise. As is commonly the case in the domain of applied science, the staff is highly qualified. Eight of the seventeen lecturers (47%) have a PhD degree in a relevant field of study. The team features a range of specialisms, including chemical engineering, material physics, molecular sciences, biomedical sciences and analytical chemistry. In addition, the team also includes specialists in (intercultural) communication, management and circular economy.

Three teachers are involved in a research group. Two of them are active for the Urban Metabolism research group and one lecturer works for the Technology for Health research group. This ensures a link between research and education, because the teachers who do research integrate their knowledge and their experiences in their lectures and coaching.

The teaching staff represents six nationalities (Dutch, Portuguese, Russian, French, Chinese, Singaporean). This links with the PFT profile, which focuses – among other things – on the ability to work in an international environment. The presence of teachers of Asian descent is of added value to the Asian students.

The teachers were recently tested on their English language skills. The average score of the team was high (C1). The panel learned from the students that they too are satisfied with the English language proficiency of their teachers. Some teachers speak English fluently, but others have an accent which is difficult to follow at first. "You have to get used to it, but once you recognise the accent and the patterns in it, it's easy to follow," one of the students stated.

In many ways, students are truly positive about their teachers as is confirmed by the NSS scores in this respect (between 3.5 and 4.1). From the interviews that the panel conducted with students and teachers, it became clear that the lecturers are engaged, competent, student oriented, eager to learn, as well as socially coherent and thus a true team. The team represents inclusiveness, which is a good example for the students. 90% of the teachers have a BDB or PDV certificate. All new teachers have to follow a didactic course to obtain the BDB certificate. Nevertheless, students stated that the didactic skills of a few teachers can still be further developed (to get beyond the use of PowerPoint).

Recently the team as a whole has followed working sessions on internationalisation to help them define more clearly the international competencies regarding knowledge, skills and behaviour in the curriculum. These sessions were organised together with the international office of THUAS. In addition, four team members followed a course on Intercultural Communication, organised by HCTL. A large group of teachers attended a course conducted by an international assessment professional on the latest developments regarding assessments.

The management explicitly focuses on professionalisation. This is not only evident from the professionalisation plan for the teaching staff, but also from the discussions with the lecturers and the management.

Every teacher has a personal development plan which is reviewed in the performance interviews with the team leader three times a year. PFT offers lecturers a broad scope of professionalisation activities. A request for participation in (international) meetings such as the Institute for Sustainable Process Technology is always honoured, according to the lecturers.

The faculty itself has a clear view on developments in the field and the training required to stay connected with current events in the domain. For example, one of the lecturers enrolled on a training about data science, with the aim of embedding this more strongly into the curriculum.

Considerations and judgement

The staff is well-equipped and highly educated in terms of domain-specific and research expertise. The panel determined that the international composition of the team of lecturers truly contributes to creating an international and multicultural learning environment, which strongly benefits the achievement of the learning outcome on internationalisation. The panel also appreciates the involvement of the staff with their students. The course professionalisation plan is very much appreciated and the faculty's eagerness to stay in tune with new developments. The lecturers are a real team, working and learning together.

Weighing up all of the above, the panel considers Standard 6 to be **'good'**.

4.4. Facilities

Standard 7: The accommodation and material facilities (infrastructure) are sufficient for the realisation of the curriculum.

NVAO's explanation: The accommodation of the programme and the facilities are in keeping with the intended learning outcomes and the teaching-learning environment.

Findings

Facilities specifically for the Bachelor PFT

The panel considers the teaching and student areas designated to the Bachelor PFT sufficient and appropriate. The programme is situated in the main building of THUAS in The Hague. The panel went on a guided tour on the premises and reviewed the facilities specifically available to the students of the Bachelor in Process & Food Technology. The panel believes the equipment sufficiently facilitates the execution of the programme.

The panel was shown around various labs. There are (in)organic chemistry labs with fume hoods and instruments for chemical analysis. The instrumental analytical labs have analytical equipment like GC, HPLC, DSC and also 3D printers. Furthermore, there is a kinetics lab and a technology hall. The process labs contain unit operations equipment such as pumps and distillation columns. The process labs are quite standard and more chemical process equipment would be preferable. Additionally, PFT shares a cooking lab and a food lab with another programme. All the labs are well maintained and neat. Some of the equipment is slightly outdated, so the panel appreciates PFT's efforts to get new equipment. For the PFT minor Biotechnology, conducted in cooperation with DSM and TU Delft, laboratory facilities of TU Delft are available for students in this minor. To keep up with the developments in food technology, the panel would recommend offering students some equipment to enable the microbiological examination of food at THUAS.

General facilities from The Hague University of Applied Sciences

Students and teachers of PFT have access to the complete infrastructure of The Hague University of Applied Sciences. In practice, this means that they may use the service of the International Office, the study rooms, the Wi-Fi-connection, walk-in computer labs, the library, and via remote laptop get access to the digital library, etc. Both the students and the lectures told the panel that they are satisfied with the facilities, which is emphasised by the NSS outcomes.

Considerations and judgement

The panel has established that the general facilities reflect generic quality. The panel appreciates the presence of several labs covering most aspects of food design, characterisation and technologies. These laboratories and the available equipment contribute to an adequate execution of the curriculum, that features quite a number of lab workshops and projects. The panel believes that the set-up of a microbiological lab within THUAS would be a nice asset. In general, the panel agrees with the students that the facilities suffice.

The panel considers Standard 7 to be '**satisfactory**'.

Standard 8: The tutoring of and provision of information to students are conducive to study progress and tie in with the needs of students.

NVAO's explanation: Students receive appropriate tutoring (including students with a functional impairment). The information provision of the programme is adequate.

Findings

Tutoring

Individual tutoring

At the start of the programme, every student is assigned a mentor, who remains the mentor throughout the study. In the first year, the student conducts at least two interviews with his mentor about the study progress and the choices the student intends to make. In the following years, it is up to the student to contact his mentor if required. The students convey to the panel that the mentor is always available to help them. And as students say this supportive attitude holds for all teachers. Students also say they appreciate the faculty's open-door policy. In the Self-Evaluation Report, the programme mentions that it wants to intensify the mentoring system for the main phase. The panel supports this ambition and thinks it is a good idea to schedule one or two mandatory meetings with the mentor in subsequent years. Especially for international students, whose parents are not so close, it may be good to occasionally spar with the mentor to make (career) choices.

The Student Career Coaching (SCC) courses are also part of the tutoring system. During the SCC courses, which are scheduled in the first and second year of the course, students learn how to reflect on their own study behaviour, how to give and receive feedback and how to develop study skills and their personal branding.

Coaching during projects and internships

During each block, every project group is coached by a project coach. The level of coaching decreases over the years, both in intensity and content. The lecturers say that it is sometimes difficult to find the right balance. One project coach takes an hour per week to speak with his group and the other coach spends half an hour every two weeks. The students also notice these differences, as much as they observe discrepancies in the amount of supervision during internships. The panel learned from a student who had done an internship in Ghana that he had had a weekly Skype meeting with his supervisor from school, whereas another student in an internship placement abroad had had significantly less contact. The students in the audit labelled this as unfair. Although the panel agrees with the programme that the scale of the guidance strongly depends on each student's attitude, the panel would recommend to reflect on (the causes of) these perceived differences with students and supervisors.

And, as representatives from the work field told the panel, the coaching could be intensified and the schools' supervisor could show more involvement in both the intern and the company.

Information provision

The students are satisfied with the provision of information, according to the NSS outcomes. The interviews show that the students are particularly pleased with the digital platforms, used by PFT, that provide students with relevant and up-to-date information and also gives them access to block books. The panel itself has examined some of these block books and notes that these contain clear information and expectations. It gives insight into the learning objectives, the lecturers, the literature and the assessment methods. On the other hand, the panel could not always perceive the cohesion between the competency and the intended learning outcomes, as mentioned in the various block books. For example, in the manual of block 1.1 'providing feedback' is listed as one of the competencies of that block. In the competency overview, however, providing feedback was not incorporated as one of the indicators for this block.

Therefore, the panel considers it advisable to revise the block books parallel to the curriculum renewal, by making a clear link with the indicators from the matrix.

Considerations and judgement

The panel welcomes the digital environment and the availability and transparency of the block books, although the alignment between competencies and (block) indicators could still be improved. Despite PFT's open-door policy is one of its prominent assets ensuring a lot of (informal) contact between teachers and students, the panel thinks it is advisable to tailor the formal mentoring and the supervision during internships to the needs of the student, without creating too large differences in supervision intensity.

The panel appreciates the programme's supportive attitude towards students, but also identified some points for improvement. Therefore, the panel rates Standard 8 as **'satisfactory'**.

4.5. Quality assurance

Standard 9: The programme has an explicit and widely supported quality assurance system in place. It promotes the quality culture and has a focus on development.

NVAO's explanation: The programme organises effective periodic feedback that supports the achievement of the intended learning outcomes. Existing programmes implement appropriate improvements based on the results of the previous assessment. They initiate appropriate evaluation and measurement activities to that end. The outcomes of this evaluation demonstrably constitute the basis for development and improvement.

Within the institution, those responsible are held to account regarding the extent to which the programme contributes to the attainment of the institution's strategic goals. Quality assurance ensures the achievement of the intended learning results. The programme committee, examination board, staff, students, alumni and the relevant professional field are actively involved in the programme's internal quality assurance. The programme's design processes, its recognition, and its quality assurance are in keeping with the European Standards and Guidelines. The programme publishes accurate, reliable information regarding its quality, which is easily accessible to the target groups.

Findings

Through annual plans, the programme is able to formulate its own tasks. The annual plans are based on evaluation results and the policy of both the institution and the faculty. The programme uses a wide range of evaluation mechanisms. For example, each block student evaluations are conducted as well as analyses of study results. Based on the evaluation outcomes, the teachers write a block evaluation, which is submitted to the students to provide feedback. The panel has examined some of these block evaluations and established that they contain relevant and clear actions for improvement.

The students feel involved in the quality improvement of PFT and indicate that the study programme takes the suggestions for improvement to heart. However, students say they want to be informed better about the adjustments in the programme based on their feedback. In the audit one of the alumni indicated that when he read the documentation in preparation for the site visit, he noticed that improvements suggested a few years ago had been implemented.

The panel learned that there are two 'course committees', an official one and an unofficial one. The unofficial course committee consists of all class representatives. They have an evaluation meeting with a staff representation each block. In addition, there is the statutory course committee, which consists of two students and two teachers. Currently the official course committee is reviewing the development of the new curriculum, in which the evaluation results are also considered. Furthermore, the students indicate that the open-door policy makes it very easy for them to speak with a lecturer and make any suggestions for improvement.

Via the Advisory Board, the professional field is involved in the quality assurance cycle. The panel spoke with some members of the Advisory Board about the needs and requirements of the professional field with regard to the programme. The panel believes that the Advisory Board makes a constructive and valuable contribution to the continual evaluation of the intended learning outcomes. The critical but positive attitude of the Advisory Board is of added value to the content-related quality of the study programme. The Advisory Board praises the openness of the management and the staff in terms of their strengths and weaknesses. The panel also clearly recognises this openness and self-conscious attitude in the Self-Evaluation Report and considers this exemplary for a culture that is focused on learning from mistakes and is open to continuous improvement. The conversation with the chairs of both the Exam Board and the Assessment Board confirmed this observation even more (see Standard 10). Recently, partly as a result of an internal audit in 2016, changes were made to the graduation process. One of these changes was the introduction of a committee that evaluates all graduation proposals before the student actually starts his graduation research.

The current preparations for the renewal of the curriculum are well structured and so is the course's general approach to quality improvement.

Considerations and judgement

The panel concludes that the PFT programme has an adequate quality assurance system in place, thus achieving the generic level of quality for standard 9. The panel notes that the programme utilises different evaluation instruments to gain feedback from various stakeholders. The management takes feedback seriously and discusses issues that come up in evaluations with the team, leading to effective improvement plans. The last step to be taken is to inform stakeholders on the intended and executed actions.

Weighing up all of the above, the panel considers Standard 9 to be **'satisfactory'**.

4.6. Student assessment

Standard 10: The programme has an adequate student assessment system in place.

NVAO's explanation: The student assessments are valid, reliable and sufficiently independent. The quality of interim and final examinations is sufficiently safeguarded and meets the statutory quality standards. The tests support the students' own learning processes.

Findings

The assessment policy of PFT originates from the faculty assessment policy, the THUAS assessment policy and PFT's educational vision. The Programme and Examination Regulations document outlines the arrangements regarding resits, irregularities, fraud, plagiarism, and sanctions. The appendix of this document features the test format, the weighing factors of partial tests, and the approximate test moment. The block books contain information about the test formats used within that block. The panel reviewed several block books, which show that theory is being assessed through a so-called Over-All-Test (OAT). An OAT includes all subjects students have had in the corresponding block excluding Communication, Study Career Coaching and English. These subjects have their own assessment methods. The OAT at the end of block 2.3 which is on Responsible operation will cover, among other things, Reaction Kinetics, Thermodynamics and Cost Estimation. The fact that four or five subjects are integrated into one OAT, does in the view of the panel not exclude the possibility of students passing these tests without really having mastered all the right knowledge. This is particularly caused by the used weighing factor for (parts of) the test. The panel encourages the programme to address the panel's finding in the upcoming revision of the OATs.

In every block students have to work on a project for the purpose of which the block books contain the project assessment rubric, the peer-to-peer evaluation form and information about the desired format of the project report. Overall, the panel is very positive about the transparent information on the assessment methods in the block books.

In general, the panel perceived an adequate mix of test formats in which the relationship with the Bloom taxonomy is evident. With, for instance, written tests for remembering, understanding and applying. And project reports and presentations for applying, analysing and evaluating. This method mix contributes to the validity of the assessment in the PFT programme.

The examination handbook for the Faculty of Technology, Innovation & Society (TIS) covers the entire PFT programme. This handbook explains in clear terms the relationship between the educational vision and the examination philosophy of TIS. It comprises the assessment policy as well as the practical agreements and procedures to safeguard the quality of assessments. For example, the handbook explains the use of uniform assessment formats and the marking instructions to enlarge the reliability of a test. Also, the mandatory deployment of two assessors in a performance assessment is defined. The panel noted that the programme also uses this four-eyes principle for the construction of tests. The panel reviewed some of the tests and determined that the test matrices and the assessment keys are fine. Also, the panel, to its satisfaction, noted that the programme organises internal calibration sessions and external (DAS) reviews on the assessment of the graduation theses.

Based on the review of various tests the panel established that they all include clear instructions for the students, that the questions are relevant, relate to the context and are sufficiently challenging.

Exam Board and Assessment Committee

The Exam Board covers three programmes; besides PFT, these are Applied Mathematics and Applied Physics. The board consists of five members, including a chair, an executive secretary and three members. These three members are chair of the three programme Assessment Committees as well.

The panel spoke with some members of the Exam Board and considered them well-qualified for their job. They attend training and professionalisation activities and recently took a course on fraud and plagiarism. At the beginning of the academic year the Exam Board draws up an activity calendar for the whole year featuring all themes and tests to be scrutinised in that year. For example, this year the Exam Board will be evaluating all OATs. The panel appreciates this systematic approach. Recently, the Exam Board reviewed its fraud and plagiarism policy as well as a sample of the graduation theses, the latter resulting in several adaptations of the graduation process.

In tune with its legal duties the Exam Board appointed the examiners upon recommendation of the team leader. The team leader selects able examiners on the basis of their experience and qualifications.

In general, the members of the Exam Board are allocated sufficient time for their jobs. However, compliance with the Modern Migration Act⁴ costs the Exam Board more time than anticipated. There is also an ethical component, which the committee does not feel adequately equipped for. The panel draws attention to the psychological aspects involved in making decisions in this context.

The assessment committee works according to the THUAS regulations. At the beginning of a module, it checks the block book on competences, test format, duration of a test, the presence of a test matrix, etc. The four-eyes principle is applied to the construction of assessments. Furthermore, the assessment committee analyses the results of the first-year assessments, as these are particularly important to qualify for the foundation year (*propedeuse*). The committee is deliberately more reactive and less pro-active when it comes to the assessments in the higher years.

Graduation Programme

The last semester of the PFT programme, students do their graduation internship and write their thesis (30 EC in total). Students may only start writing their thesis once they have completed all of the other blocks. The two graduation coordinators must approve the graduation proposal before the student may actually start his graduation internship and research. During graduation students have to demonstrate to have achieved the main three competencies Research, Experimentation and Development at the required level (Research or Development at level 3, Experimentation at level 2). In parallel to the graduation project, and in order to demonstrate the achievement of the other competencies, students need to work on a graduation assessment portfolio.

The final mark is the average of the marks of four products: the work in the company (25%), the final report (25%), the presentation (25%) and the defence (25%). The internship supervisor and two assigned PFT lecturers are the assessors. The company coach gives a mark for the work at the company, which is an advice given to the assessors. The PFT assessors are ultimately the ones awarding the grades. In order to pass, students must obtain at least 5.5 for each partial product.

⁴ Students from outside the European Union and the European Economic Area must obtain a residence permit to study in the Netherlands. When these students don't pass the foundation year, they run the risk of being sent back to their home country, also when it concerns a conflict area.

Considerations and judgement

The panel is pleased with the assessment system of the course. All assessments include clear instructions and relevant questions related to the context and are challenging to the right degree. PFT's assessment policy contributes to the reliability, transparency and validity of assessments. The panel finds the assessment matrices useful. Still, the Over-All-Tests require attention when it comes to the weighing of the substantive topics within these tests.

In general, the panel is satisfied with the performance of the Exam Board. Its members have the adequate qualifications for their tasks. The panel considers it advisable to facilitate the Exam Board to make them more confident about dealing with the Modern Migration Act.. The panel considers the graduation process and its assessment procedures adequate.

Taking into consideration the positive observations and the points for improvement, the panel considers Standard 10 to be '**satisfactory**'.

4.7. Achieved learning outcomes

Standard 11: The programme demonstrates that the intended learning outcomes are achieved.

NVAO's explanation: The achievement of the intended learning outcomes is demonstrated by the results of tests, the final projects, and the performance of graduates in actual practice or in post-graduate programmes.

Findings

Theses

To find out whether the students have actually achieved the intended learning outcomes of the Bachelor PFT the panel selected and studied a representative sample of 15 theses. The sample contained both theses from the Food and the Chemical specialisation as well as theses from fast track students. For their review, the panel used the same assessment method and forms as those applied by the examiners in the Bachelor PFT.

The panel concludes that the overall level of the theses selected is acceptable and shows that students achieve the learning outcomes. In general, the students have the knowledge and skills to perform a research project at the desired level. Also, the internship assignments were consistent with the potential work in industry at Bachelor's level. Particularly, the most recent graduation assignments feature a proper context evaluation and demonstrate solid strategies to answer a well-defined research question. Some of the research questions, however, were not that convincing yet. Most of the theses the panel read come from the 2016-2017 cohort. In the last two years the programme made various improvements in the graduation phase. In the eyes of the programme the coaching of students was one of the key elements. Therefore, in 2017 and 2018 the coaching of students during their graduation internship was intensified. In this way, the programme can keep a better eye on the progression and quality of the graduation assignment. Furthermore, the panel established that in some cases, the structure of the reports was not clear. Last year, however, the programme started to give workshops on writing skills and communication skills to better prepare students for constructing and formulating their own research question. Also, a committee has been installed to check and endorse the assignments before students can actually start their graduation internship. To gain insight into the effects of these improvements, the panel also reviewed two recently produced reports. It concluded that the quality of these theses is truly better than most of the theses the panel had reviewed prior to the site-visit. In fact, they convincingly meet the industry's needs.

Alumni and the work field

Alumni with whom the panel spoke were positive about the PFT programme. The curriculum has provided them with a solid foundation on which they can continue to build once they are working for a company. As one of the alumni formulated it: "You cannot know everything when you start your first job. But we were taught how to learn, so we can easily adapt and grow into our jobs". In the spring of 2018, the programme executed an alumni survey, that showed that most of the students found a job at the hbo-level or higher. Also, all of the respondents were satisfied with the way in which the programme had prepared them for their job.

The professional field representatives could relate to this. They said that PFT students can handle unforeseen situations. "The students all have a sufficient theoretical background, but they make a difference when it comes to creativity and flexibility", as one of the Advisory Board members told the panel. The professional field representatives regularly offer graduates a job. They experience that most THUAS students operate at a comparable level to students from other universities of applied science.

Some students choose to continue their studies at a university. Some of these (Dutch) students had deliberately chosen for the THUAS programme, because it prepared them sufficiently for the English language, and most subsequent university programmes are taught in English as well. The panel spoke to a student who had gone to Eindhoven University of Technology after having finished PFT. The connection between the PFT bachelor programme and the TUE premaster programme was appropriate, he told the panel. He experienced an advantage over his fellow students because of the way in which PFT had taught him to collaborate in group assignments and to make joint decisions.

Considerations and judgement

The panel concludes that the overall quality of the achieved learning outcomes is sufficient. The theses from the 2016-2017 cohort were at basic bachelor level, but the most recent theses demonstrated that the implemented improvements with regard to writing skills, the approval of the proposal and coaching had truly payed off and resulted in much better research designs and reports. Furthermore, from the alumni's perspective the programme fits the demands of the labour market, which was confirmed by the professional field representatives in the audit.

Taking into consideration all of the above, the panel considers Standard 11 to be **'satisfactory'**.

5. OVERALL JUDGEMENT

The Bachelor in Process & Food Technology of The Hague University of Applied Sciences is a study programme that is appreciated by its students and alumni. The programme is of a small-scale, and uses this strength in its formal and informal study support system, in which the staff's 'open-door policy' plays an important role. The panel appreciates the programme's close-knit connections with the professional field and the active role that professionals play in the projects and workshops. The possibilities for students to create their own profile along the way is also a nice asset of the programme.

Even so, the panel found points for improvement and reconsideration. The panel recommends the programme to reflect on its title and on the perceived differences in intensity of mentoring during internships. In addition, the programme could strengthen the integration of theory and projects, and it should provide stakeholders with better information about implemented improvements.

Based on the NVAO judgement and assessment rules, the panel arrives at the overall judgement '**satisfactory**' for both variants of the programme.

The panel advises the NVAO to accredit the Bachelor in Process & Food Technology of The Hague University of Applied Sciences for another six years.

6. RECOMMENDATIONS

- Elaborate on the title of PFT from a content point of view and try to clarify what is meant by the name of the programme.
- Further improve and emphasise the international orientation of the programme and carefully consider the objectives of internationalisation in the programme. Relevant questions are: What does internationalisation – with respect to both knowledge and skills - mean in the domain and what do we want our students to learn?
- Increase the coherence of the programme by further integration of theory and projects.
- Monitor the performance of students in relation to their prior education.
- Intensify and balance the guidance during internships, both in the Netherlands and abroad.
- Check all block books on a clear connection between the indicators and the competencies addressed in any specific block.
- Facilitate the Exam Board in time and knowledge, for them to feel more confident to deal with the Modern Migration Act.
- To keep up with the developments in food technology, consider offering students some equipment for the microbiological examination of food.

The panel has one additional recommendation, not directly related to one of the standards:

- During the guided tour on the school premises the panel entered some labs, without being provided safety glasses. In line with this the panel could not come to grips with the issue of whether there was any regular discussion within the course on safety precautions or the enforcement of the safety policy. As this is a very important aspect within the professional field, the panel recommends the programme to make the safety policy more visible and more meaningful.

ANNEX I Overview of judgements

Bachelor in Process and Food Technology The Hague University of Applied Sciences Fulltime	
Themes / Standards	Judgement
Intended learning outcomes	
Standard 1. Intended learning outcomes	S
Curriculum	
Standard 2. Orientation	S
Standard 3. Content	S
Standard 4. Learning environment	G
Standard 5. Intake	S
Staff	
Standard 6. Staff qualifications and numbers	G
Facilities	
Standard 7. Accommodation and infrastructure	S
Standard 8. Tutoring and information provision	S
Quality assurance	
Standard 9. Quality assurance	S
Assessment	
Standard 10. Student assessment	S
Achieved learning outcomes	
Standard 11. Achieved learning outcomes	S
Overall judgement	S

ANNEX II Programme of site-visit

Programme: Bachelor in Process and Food Technology, The Hague University of Applied Sciences

Location: Johanna Westerdijkplein

Time	Subject	Participants
8.15 - 9:00	<i>Meeting of auditors</i>	<i>Auditors</i>
9:00 - 9:45	Strategic policy, profile, developments	Management Faculty and PFT Faculty Director Programme Manager Teamleader
9.45 -10.30	Curriculum & didactics: contents, design, alignment	Block coordinators Coordinator 1 st year Coordinator 2 nd year Internship coordinator Specialisation coordinator
10.30 -10.45	<i>Consultation auditors</i>	
10.45 -11:30	PFT programme from a student perspective	Students from course committee, student representatives, and others
11:30 -12.10	Quality assurance system for assessment and end level students	Chair Assessment Committee Chair Exam Board
12:15 -12:45	Internship & Graduation	Internship coordinator Graduation coordinators and supervisors
12.45 - 13.30	<i>Lunch / consultation auditors</i>	
13:30 - 14:00	Internationalisation and research	Coordinator Internationalisation and university lecturers Coordinator Internationalisation Research lecturers (2x)
14.05 - 14.35	Students at work, part 1 (cooperation, coaching, assessment, facilities and housing)	Lecturers and students Cheese project, visit (incl. guest lecturer and students); Extracurricular activities
14:35 - 14.55	Students at work, part 2 (cooperation, coaching, assessment)	Lecturers and students Water Treatment project (lecturer and students)
15.00 - 15.30	<i>Consultation auditors</i>	
15:30 - 16:15	Quality of alumni	Advisory Board: Representative DSM Representative Unilever Representative Albemarle Company coaches internship: Representative Crooked Spider & Brouwerij Scheveningen Representative Hexion Alumna
16.15 - 16.30 16.30 - 17.15	<i>Pending issues</i> <i>Consultation auditors</i>	
17:15 - 17:45	Feedback by the panel	PFT Team

Proceedings

Selection of the delegations / the auditees

In compliance with the NVAO regulations the audit panel prior to the audit decided on the composition of the delegations (auditees) in consultation with the course management and on the basis of the points of focus that had arisen from the panel's analysis of the course documents.

Auditing process

The following procedure was followed. The panel studied the documents regarding the programme (Annex III: Documents reviewed) and a random selection of theses. The panel secretary organised input from the auditors and distributed the preliminary findings among the panel members prior to the audit. A preparatory meeting of the panel was held before the site visit took place.

The panel formulated its preliminary assessments per theme and standard immediately after the site visit. These were based on the findings of the site visit, and building on the assessment of the programme documents.

A first version of the assessment report was drafted by the secretary and circulated among the members of the panel for review and comments. The final draft was subsequently forwarded to the institute to correct factual inaccuracies.

Assessment rules

The overall judgement **Excellent** is awarded if at least five standards obtained the rating excellent, one of which must be standard 11, and a judgement of at least 'Satisfactory' was assigned to the remaining standards. An overall **Good** is awarded if at least five standards, one of which must be standard 11, and a judgement of at least 'Satisfactory' was assigned to the remaining standards. An overall **Satisfactory** is awarded if at least six standards, one of which must be standard 1, and improvement of the shortcoming(s) identified under the standards scored 'unsatisfactory' must be realistic and feasible within two years. **Unsatisfactory**: i) standard 1 is scored. An overall **Unsatisfactory** is given if either i) at least six standards are scored 'unsatisfactory' and improvement within two years is neither realistic nor feasible; or ii) less than six standards are scored 'satisfactory'.

ANNEX III Documents reviewed

List of documents examined by the panel:

- Self-Evaluation Report PFT THUAS 2018
- Graduation list 2016-2017
- Graduation list 2017-2018
- BSc Applied Science Profile PFT 2016
- BSc Applied Science addendum, 2018
- Two extra PFT competencies
- PFT Graduation manual 2018-2019
- Rubric Graduation for company coach 2017-2018
- 2018-2019 PER PFT
- PFT staff expertise
- Selection of block books over the years (block 1.1., block 2.3, block 2.4, Chemical specialisation elective 3, communication, internship reports, minor food product design, risk management, SCC, specialisation Functional Food, Topics in Mathematics)
- Minutes of the Advisory Board meetings
- Educational plan PFT 2019

Final products examined by the panel

The panel has studied 15 students' final projects. For privacy reasons, the names of these graduates and their student numbers are not included in this report. The names of the graduates, their student number, as well as the titles of the final projects, are known to the secretary of the audit panel.

List of 15 final theses that were studied by the panel prior to the audit:

#	Variant	Specialisation
1.	Fast track	Food
2.	Fast track	Process
3.		Process
4.		Process
5.		Food
6.		Process
7.		Process
8.		Process
9.		Process
10.		Food
11.	Fast track	Food
12.		Food
13.		Process
14.		Process
15.		Process

ANNEX IV Composition of the panel

Name visitation cluster:	HBO Life Science and Technology 1
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Panel composition and expertise of the panel members that played a role in the visitation of the assessed programme.

Name	Position	Expertise						
		Discipline	International	Teaching	Assessment	Professional field	Auditing and QA	Student-related
Prof. dr. Wes Wierda	Chair		x	x	X		x	
Dr. Emmanuel Perrin	Expert member	x	x	x	x	x	x	
Dr. Gino Strijdonck	Expert member	x	x			x		
Boyd van Woudenberg	Student member							x

Succinct resumes of participating panel members:

Name	Succinct CVs
Prof. dr. Wes Wierda	Mr. Wierda is a consultant at Hobéon. He regularly participates in accreditation panels as domain expert and/or as lead auditor for audit panels in the context of higher education accreditations.
Dr. Emmanuel Perrin	Mr. Perrin is director of the R & D department of Danone Nutricia.
Dr. Gino Strijdonck	Mr. Strijdonck is <i>lector</i> Material Sciences Hogeschool Zuyd, CHILL
Boyd van Woudenberg	Mr. Van Woudenberg studies Chemical Engineering at Hogeschool Utrecht. He is member of the Institutional Council.

Inge van der Hoorn MSc	is NVAO-trained secretary.
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On 23 June 2018 the NVAO endorsed the composition of the panel to assess the Bachelor in Process and Food Technology of the Hague University of Applied Sciences, registration #007103.

Prior to the audit all panel members undersigned declarations of independence and confidentiality which are in possession of the NVAO. This declaration certifies, among other things, that panel members do not currently maintain or have not maintained for the last five years any (family) connections or ties of a personal nature or as a researcher/teacher, professional or consultant with the institution in question, which could affect a fully independent judgement regarding the quality of the programme in either a positive or negative sense.



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