Assessment report
Limited Framework Programme Assessment

Bachelor Creative Technology

The University of Twente

Contents of the report

1. Executive summary

In this executive summary, the panel presents the main considerations which led to the assessment of the quality of the Bachelor Creative Technology of the University of Twente. The programme was assessed according to the four standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands.

The panel regards the objectives of the programme to be valid objectives for students who want to be T-shaped engineers in this inter-disciplinary field of engineering and human-centred design. In the domain-specific framework of reference, the programme domain has been adequately described. The intended learning outcomes of the programme meet the programme objectives and specify with appropriate level of detail the knowledge and skills in the various disciplines students ought to acquire. The intended learning outcomes meet the bachelor level requirements.

The panel notes programme management took the recommendations of the previous panel seriously and adequately followed up on these by implementing a number of improvements. Among others, the domain-specific framework of reference was rewritten, research skills in the curriculum were strengthened, the quality assurance was formalised, and the oral feedback by lecturers on students' assignments and projects was improved.

Programme management has taken steps to include the professional field perspective and to make students understand the future careers that are open to them. The panel, nevertheless, recommends to involve representatives from industry and alumni from the programme more intensively, in order to further clarify the career perspectives for students.

The choice of the English programme name, and the choice for English as the main language for instruction have been adequately motivated and are approved by the panel.

The programme appears to attract considerable numbers of students. The panel noted programme management to consider the intake numbers as being manageable. The entry requirements of the programme meet legal requirements for academic bachelor programmes in the Netherlands. The admission procedures have been well-organised.

The curriculum matches, so the panel established, the programme intended learning outcomes. The educational concept of the programme allows students to acquire knowledge and skills in the constituent disciplines as well as to work on inter-disciplinary projects. The curriculum is both coherent and rich in possibilities for students. The curriculum addresses academic skills, including research skills, satisfactorily. Professional competencies are covered appropriately in the curriculum. The panel, nevertheless, recommends to draft and make more explicit the competency-framework, in order to clarify for students the professional competencies needed to achieve the careers which may be open to them.

The lecturers have good credentials in terms of educational expertise and academic qualifications. The programme is related to and benefits from the research done by the lecturers. The panel is pleased to see lecturers from other Faculties being involved in the programme, so social sciences' perspectives are covered as well. The panel recommends for staff members to reflect upon and to communicate the overarching mission of the programme in terms of the professional competencies of students needed for their future careers.

The lab facilities available for students are appropriate. The panel recommends to recruit extra lab technicians, to avoid the risk of insufficient technical assistance.

Although the study load in the programme is adequate, the panel supports the steps programme management intends to take to offer more challenging learning activities for talented students. The hours of face-to-face education and the student-to-staff ratio allow students to proceed to the programme with appropriate guidance. While drop-out rates of the programme are favourable, the student success rates are relatively low. The panel acknowledges this may be the result of students doing extra activities, which are relevant in the context of the programme.

The rules and regulations on examinations and assessments of the programme as well as the position and activities of the Examination Board are adequate. The quality assurance measures taken by programme management to assure the validity, reliability and transparency of examinations and assessments are up to standard. The panel is of the opinion programme the risk of free-riding in group projects is satisfactorily countered in the programme.

The examination methods are varied and meet the knowledge and skills to be assessed. The panel recommends to draft rubrics forms to more explicitly assess the professional competencies of students. The assessment procedures for the graduation project assignment are up to standard, including the graduation assessment form and the assessment criteria listed for the project.

Programme management took measures to provide adequate education as well as examinations and assessments during the Covid-crisis, to assure the quality of these, and to monitor the well-being of students.

The examinations of the courses are adequate. All fifteen graduation projects the panel reviewed were found to be at least satisfactory. Most projects are regarded by the panel to be satisfactory or good, while some projects were found to be excellent. The panel considers some of the graduation projects to be very interesting. The panel generally agreed with the grades given to the graduation projects by the programme examiners. For a limited number of projects, the panel would have given different marks, but the differences are only slight and certainly not systematic.

The panel is positive about graduates from the programme having succeeded in publishing their graduation projects or presenting these at conferences and is also positive about the companies graduates have started. To counter the relative lack of self-confidence some graduates may have, the panel suggests to communicate the strong points of the programme more clearly, and to present these in the form of narratives or programme graduates personas.

The panel which conducted the assessment of the Bachelor Creative Technology of the University of Twente 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 positive. Therefore, the panel recommends the NVAO to accredit this programme.

Rotterdam, 16 April 2021

Prof. B.A.M. Schouten PhD, BA
(panel chair)

W. Vercouteren MSc
(panel secretary)

2. Programme administrative information

Name programme in CROHO:	Bachelor Creative Technology
Orientation, level programme:	Academic Bachelor
Grade:	BSc
Number of credits:	180 EC
Specialisations:	N.A.
Location:	Enschede
Mode of study:	Full-time
Language of instruction:	English
Registration in CROHO:	21PH-50447
Name of institution:	The University of Twente
Status of institution:	Government-funded University
Institution's quality assurance:	Approved

3. Findings, considerations and assessments per standard

3.1 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 Bachelor Creative Technology of the University of Twente is an academic bachelor programme, which carries 180 EC of study load and takes three years to complete. The programme is one of the bachelor programmes of the Faculty Electrical Engineering, Mathematics and Computer Science, being one of the five Faculties of this University. Programme management is composed of the programme director, the programme coordinator and the study advisor. The programme committee, consisting of equal numbers of lecturers and students, advises programme management on the quality of the programme. The curriculum committee, on which six core lecturers sit, has the task of assuring the intended learning outcomes and the curriculum of the programme to be up-to-date. The study association is important in fostering the community feeling among students. Programme management meets regularly with the study association board. The Examination Board monitors the examinations and assessments of this programme and the Master Interaction Technology of the University of Twente, which may be considered to be the follow-up master to this programme.

Programme management followed up on the recommendations of the previous assessment panel. Among others, programme management rewrote the domain-specific framework of reference, strengthened research skills in the curriculum, formalised the quality assurance, and improved the oral feedback by lecturers on students' assignments and projects.

Management of the programme drafted the domain-specific framework of reference, because no generally accepted reference frameworks for this domain are available. Following this domain-specific framework, the objectives of the programme are to train students to design human-centred hardware devices, web applications or (serious) games. The objectives of the programme entail students to acquire knowledge and skills in electrical engineering, computer science, design, entrepreneurship and art. As students are educated in these various disciplines and the integration of these disciplines, the programme may be regarded to be inter-disciplinary. Students are trained to become T-shaped engineers in this field, on the one hand having solid grounding in engineering and on the other hand broadening their knowledge and skills to design, social sciences and entrepreneurship. In addition, students are to acquire academic and professional skills. The programme has been compared to similar programmes in the Netherlands and abroad.

In the domain-specific framework of reference, the objectives have been laid down in consolidated requirements for students. These requirements in turn have been the basis for the intended learning outcomes of the programme. These specify students when completing the programme to be able to manage design processes; to understand and use technology, among which physical systems and

computing; to design for interaction, expression, impact and experience; to have societal, economic and global competencies; and to have academic and professional skills. These five intended learning outcomes have been subdivided into a range of more detailed and more specific intended learning outcomes.

The intended learning outcomes meet the bachelor level, as they are consistent with the Meijers' criteria, which have been accepted for programmes of universities of technology as indicators for the academic bachelor level.

In the programme, a number of links have been established with the professional field. Programme management is advised by the Advisory Board with experts in this field, coming both from industry and academia. This Board advises on steps to be taken to establish the programme in the professional field. In addition, students may do internships in companies or organisations and may complete assignments in their graduation projects for clients from the professional field. Students conduct interviews with alumni from the programme to understand future careers in industry.

The English name of the programme and English as the language of instruction in the programme have been chosen to align the programme to the international character of the programme domain and to allow international students to participate in the programme.

Considerations
In the panel's view, the programme organisation is appropriate.

The objectives of the programme have been clearly formulated. They are endorsed by the panel as being valid objectives for students who want to be T-shaped engineers in this inter-disciplinary field of engineering and human-centred design. The panel greets the domain-specific framework of reference for the programme as describing the programme domain adequately and as contributing to clarify the profile of the programme.

The panel agrees with the intended learning outcomes of the programme. These meet the objectives of the programme and specify with appropriate level of detail the knowledge and skills in the various disciplines students ought to acquire. The panel has established the intended learning outcomes meeting the bachelor level requirements.

The panel notes programme management took the recommendations of the previous panel seriously and adequately followed up on these by implementing a number of improvements. Among others, the domain-specific framework of reference was rewritten, research skills in the curriculum were strengthened, the quality assurance was formalised, and the oral feedback by lecturers on students' assignments and projects was improved.

The panel appreciates the steps programme management has taken to include the professional field perspective in the programme and to make students understand the future careers that are open to them. The panel, nevertheless, recommends to involve representatives from industry and alumni

from the programme more intensively, in order to further clarify the career perspectives for students.

The choice of the English language for the programme name and as the language of instruction has been adequately motivated and is approved by the panel.

Assessment of this standard
These considerations have led the assessment panel to assess the programme to meet Standard 1, Intended learning outcomes.

3.2 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
Prospective students are informed about the programme through information on the programme website, and on open days and student-for-a-day days, on which they experience the programme. The number of students entering the programme rose from 93 students in 2015 to 121 incoming students in 2019. About 25 % of the students are international students and about 75 % of them come from the Netherlands. The number of applicants increased from 200 to 350 applicants. Only part of the applicants participate in the compulsory study-choice check or matching procedure. After having taken part in the matching procedure, students obtain the advice to either or not enrol in the programme. The entry requirements for the programme are conform to the legal requirements for academic bachelor programmes in the Netherlands. Students with secondary education diplomas (VWO in Dutch) from all profiles are admissible. Any deficiencies in mathematics and physics are remedied in the first parts of the curriculum.

In line with University of Twente education policy, the *Twente Educational Model* has been adopted as the educational concept for the programme. Following this educational concept, the curriculum has been divided into twelve modules of 15 EC each. All modules address specific inter-disciplinary themes or challenges. In the modules, the focus is on inter-disciplinary projects, which embody these themes or challenges. Within the modules, courses are scheduled, in which students acquire specific knowledge and skills required to complete the projects. The teaching methods which are used in the programme, are lectures, tutorials, lab sessions, guided or non-guided self-study and supervised or non-supervised projects. Projects are done by students in groups. In the composition of groups, diversity of students is taken into account.

In the first year of the programme, the modules offer theoretical grounding in the constituent disciplines and the broad introduction to the programme domain. Part of the first module is the *Sprintweek*, offering intensive mathematics training for both students on the basic level or the more advanced level. In the second year, the modules offer more in-depth knowledge and skills and allow students to proceed further in engineering and other disciplines. In this year, students specialise in either smart technology or interactive media. In the third year, students take minor modules, allowing them to broaden or deepen their knowledge and skills in specific areas, to do an internship at external organisations, to go abroad or to prepare for specific master programmes. Professional and academic skills are taught in the modules. As part of the academic skills training, students are educated in research skills, such as doing literature research and applying research methods. Research skills are especially prominent in the eleventh module, being the first part of the final *Graduation Project Assignment*. Professional skills training is organised in the *Professional Development* course, which spans all modules. Students work on their professional competencies on the basis of the goals, they have set. Students are guided in their development by mentors, who

have been specially recruited for this task. In each of the modules, both individual and group meetings are scheduled between students and their mentors.

All of the intended learning outcomes of the programme are addressed in the modules. This is also demonstrated by the learning lines, which mirror the intended learning outcomes, being addressed in each of the modules.

The staff lecturing in the programme are active researchers in their field of expertise, while 79 % of them have PhDs. About 90 % of the lecturers have obtained the University Teaching Qualification. Lecturers teaching in the programme, do not only come from the Faculty Electrical Engineering, Mathematics and Computer Science, but also from other Faculties, in particular the Faculty of Behavioural, Management and Social Sciences. These lecturers address subjects from the social sciences' perspective. Experts on psychology are involved in psychology courses in the programme. Lecturers are assisted in tutorials by teaching assistants, who are students mastering the course subjects very well.

Students work on the practical parts of their assignments and projects in labs. The Faculty SmartXP Lab and the University Design Lab are open to them. Especially, the SmartXP Lab is intensively used by students of this programme. In the SmartXP Lab, one lab technician on a permanent basis is available to assist students.

Students regard the overall study load of the programme as adequate. Some of the talented students feel less challenged and would appreciate the programme including more demanding learning activities. Programme management intends to introduce the so-called Plus-programme to accommodate the needs of these students. The hours of face-to-face education range from 20 hours to 30 hours per week. In module 7 and during the graduation project assignment in the last two modules the number is less, ranging from 12 hours per week to 3 hours per week. The students-to-staff ratio is about 15 (120 students and on average 8 lecturers per module).

The drop-out rates in the programme decreased from 29 % after two years for the 2014-cohort to 21 % after two years for the 2017-cohort. These drop-out rates are lower than those in other engineering programmes in the Netherlands. The student success rates remained rather stable over the years, being on average 53 % after four years for the most recent cohorts of 2012 to 2015. Programme management explained students tend to do interesting and relevant activities in and alongside the programme. These activities add to the time it takes to complete the programme.

Programme management has taken measures to organise education in the Covid-crisis and to monitor the quality thereof. Teaching activities are changed to online activities. Only if permitted, activities take place on campus. Lab sessions are converted to online sessions as well. Students are sent tools to participate in online lab sessions. Teaching assistants are given the task to detect students who risked falling behind. By frequently discussing online education with module coordinators, the programme committee and the study association, programme management monitors the quality of online education and assures students reaching the intended learning outcomes. Students are actively approached to inquire about their well-being. The study adviser

supports students who have concerns. Extra teaching assistants have been recruited to assist students. Extra study meetings are scheduled.

Considerations
The panel is positive about the number of incoming students, as the programme appears to attract considerable numbers of students. The panel noted programme management to consider the intake numbers as being manageable.

The panel approves of the entry requirements of the programme, as they meet legal requirements for academic bachelor programmes in the Netherlands. The admission procedures have been well-organised.

The curriculum corresponds, so the panel established, to the intended learning outcomes of the programme. The panel welcomes the educational concept of the programme, as this allows students to acquire knowledge and skills in the constituent disciplines as well as to work on inter-disciplinary projects. The panel sees the curriculum as being rich in possibilities for students. The curriculum is coherent and covers the knowledge and skills students require in this domain. The panel recommends, nevertheless, to strengthen user methodology, to reinforce the participatory design, co-design, and co-creation approaches in the curriculum, and to teach students to see users not only as sources of information, but to work actively together with them and to become immersed in user environments. The curriculum addresses academic skills, including research skills, satisfactorily. Professional competencies are covered appropriately in the curriculum. The panel, nevertheless, recommends to draft and make more explicit the competency-framework, in order to clarify for students the professional competencies needed to achieve the careers which may be open to them.

The panel is positive about the staff lecturing in the programme, who have good credentials in terms of educational expertise and academic qualifications. The panel notes the programme to be related to and to benefit from the research done by the lecturers, and is pleased to see lecturers from other Faculties being involved in the programme, so social sciences' perspectives are covered as well. The panel recommends for staff members of the programme to reflect upon and to communicate the overarching mission of the programme in terms of the professional competencies of students needed for their future careers.

The panel considers the lab facilities available for students to be appropriate. The lab technician is much appreciated by students. The panel recommends to recruit extra lab technicians, to avoid the risk of too little technical assistance.

The panel sees the study load as adequate for this programme. The panel, nevertheless, supports the steps programme management intends to take to offer more challenging learning activities for talented students. The hours of face-to-face education and the student-to-staff ratio are adequate and allow students to proceed to the programme with appropriate guidance.

While being positive about the drop-out rates of the programme, the panel notes relatively modest student success rates. The panel acknowledges this may be the result of students doing extra activities, which are relevant in the context of the programme.

As the panel observed, programme management took measures to provide adequate education during the Covid-crisis, to assure the quality of this education, and to monitor the well-being of students.

Assessment of this standard
These considerations have led the assessment panel to assess the programme to meet Standard 2, Teaching-learning environment.

3.3 Standard 3: Student assessment

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

Findings
The examination and assessment rules and regulations for the programme meet the University and the Faculty frameworks and policies, and are laid down in programme's Education and Examination Regulations and Examination Board Rules and Guidelines. The assessment regulations were changed to some extent when introducing the Twente Educational Model 2.0, in the academic year 2020/2021. Previously, students had to succeed for all module components to pass the 15 EC modules. Now, the modules have been divided into study units with less than 15 EC per unit.

The Examination Board monitors the quality of examinations and assessments. In a formal sense, one of the sub-committees of the Faculty Examination Board is responsible for this programme. The responsibilities of the Examination Board are, among others, to appoint examiners, approve assessment plans, assure the quality of final projects and determine students being entitled to obtain their diplomas. On behalf of the Examination Board, the assessment-subcommittee reviews the examination methods used in modules.

In the programme, a range of examination methods has been adopted. Examination methods include, among others, written examinations, oral examinations, demonstrations, assignments, essays, reports, lab journals, and digital portfolios. The examination methods are derived from the course goals and course contents to be tested.

The final project of the programme is the individual Graduation Project Assignment. Students do these projects for clients, being either external clients from organisations in the professional field or researchers at the University. The work of the student is assessed on the basis of the graduation assessment form with a number of weighted assessment criteria, such as research question, design method, design evaluation, conclusion and professional and academic skills. During their projects, students are guided by their supervisor. The critical observer is involved in critical steps in the process, such as the decision to continue with the last module and to write the report, and the final presentation by the student. Each of the graduation projects is assessed by the supervisor and the critical observer, using the graduation assessment form and evaluating the project independently from each other. The opinions of the clients and the envisaged users are taken into account in the assessment.

Quality assurance measures for examinations and assessments includes, among others, draft examinations being peer-reviewed by fellow lecturers, usage of rubrics for the assessment of assignments, and discussion of grading of assignments between examiners. Students are informed about form and structure of assessments before the start of the module, are given written feedback on assignments and project and may inspect their work at review sessions. In group projects, examinations such as presentations and reports are complemented by student peer-review. Active participation in group projects is fostered and free-riding is countered. Students who contribute less

than expected will be given warnings. They may have to do extra assignments. Students who contribute extraordinary may obtain higher grades than the group mark.

Programme management has taken measures to organise examinations and assessments in the Covid-crisis and to monitor their quality. Written examinations are replaced by individual (take home) assignments. Virtual installations replace physical installations. For the practical parts of graduation projects, materials and tools are Covid-free lent at the SmartXP Lab. Multiple-choice examinations are changed to speeded-tests with randomised questions, randomised answering choices and oral follow-up for randomly selected students. If fraud is suspected, examinations are declared invalid. Thus far, this has not occurred. All alternative assessments have to be approved by the Examination Board.

Considerations
The panel finds the rules and regulations on examinations and assessments of the programme to be adequate. The panel is positive about the position and the activities of the Examination Board for the programme.

The panel finds the examination methods appropriate for the knowledge and skills to be assessed and appreciates the wide variety of examination methods being used in the modules. The panel recommends to draft rubrics forms to more explicitly assess the professional competencies of students.

The panel approves of the graduation assessment form and the assessment criteria listed for the graduation project assignment. The assessment procedures for the graduation project are up to standard.

The panel greets the quality assurance measures taken by programme management to assure the validity, reliability and transparency of examinations and assessments. The panel is of the opinion programme the risk of free-riding in group projects is satisfactorily countered in the programme.

The panel considers the measures programme management has taken to organise examinations and assessments in the Covid-crisis and to monitor the quality of these examinations and assessments to be appropriate.

Assessment of this standard
These considerations have led the assessment panel to assess the programme to meet Standard 3, Student assessment.

3.4 Standard 4: Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

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

In addition, the panel reviewed fifteen graduation project assignments of programme graduates. These graduation projects were selected from all of the projects of the last two years. In the selection, projects with various grades were included. The average grades for the graduation project assignments are relatively stable over the years, ranging between 7.5 and 8.0 for the last six years. In the graduation projects, students are to demonstrate, among others, academic skills, research competencies, design capabilities and prototyping skills. As has been said, the study load of the projects is 17 EC.

Graduates from the programme proceed to academic master programmes of the University of Twente or of other universities in the Netherlands or go abroad. About 40 % of them stay at the University of Twente, most of them taking the Master Interaction Technology.

From the cohorts 2010 to 2016, over 30 graduates from the programme started their own company. Some companies are quite successful. In collaboration with their supervisors, graduates have succeeded in publishing their graduation project in journals or in presenting this at conferences. On the other hand, some graduates expressed feeling somewhat less confident about the competencies they have acquired and the career perspectives that may be open for them.

Considerations
The course examinations, which the panel reviewed are appropriate.

The panel regards the quality of the graduation projects to be up to standard. All fifteen projects the panel reviewed were found to be at least satisfactory. No graduation projects were found to be unsatisfactory. Most projects are regarded by the panel to be satisfactory or good, while some of the projects were found to be excellent. The panel considers some of the graduation projects to be very interesting.

The panel generally agreed with the grades given to the graduation projects by the programme examiners. This included projects graded with sixes as well as with higher scores, including a 10. For a limited number of projects the panel would have given different marks, but the differences are only slight and certainly not systematic.

The panel is positive about graduates from the programme having succeeded in publishing their graduation projects or presenting these at conferences and is also positive about the companies graduates have started. To counter the relative lack of self-confidence some graduates may have, the panel suggests to communicate the strong points of the programme more clearly, and to present these in the form of narratives or programme graduates personas.

Assessment of this standard
These considerations have led the assessment panel to assess the programme to meet Standard 4, Achieved learning outcomes.

4. Overview of assessments

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

5. 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 involve representatives from industry and alumni from the programme more intensively to further clarify the professional career perspectives for students.
- To strengthen the user methodology and to reinforce participatory design, co-design, and co-creation approaches in the curriculum, and to teach students to see users not only as sources of information, but to work together with them and to become immersed in user environments.
- To draft and make more explicit the competency-framework, in order to clarify for students the professional competencies needed to achieve the careers which are open to them.
- To have staff members of the programme reflect upon and communicate the overarching mission of the programme in terms of the professional competencies of students needed for their future careers.
- To recruit extra technicians in the lab, in order to avoid the risk of insufficient technical assistance.
- To draft rubrics forms to more explicitly assess the professional competencies of students.
- To communicate the strong points of the programme more clearly, and to present these in the form of narratives or programme graduates personas, in order to counter the relative lack of self-confidence some graduates may have.

Appendix: Assessment process

Certiked VBI evaluation agency was requested by the University of Twente to support the limited framework assessment process for the Bachelor Creative Technology programme of this University. The objective of the assessment of this programme was to establish whether or not 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 of September, 2018 (officially published in Stcrt. 2019 no. 3198, 29 January 2019). This assessment was combined with the programme assessment for the Certificate for Quality in Internationalisation (CeQuint).

This programme is assessed as stand-alone programme and is not part of any of the assessment clusters of the NVAO. Management of the programme proposed the list of panel candidates.

Having conferred with management of the Bachelor Creative Technology of the University of Twente, Certiked invited candidate panel members to sit on the assessment panel. Panel members agreed to do so. The panel composition was as follows:

- Prof. B.A.M. Schouten PhD, BA, Full Professor Playful Interactions, Eindhoven University of Technology; Lector Play and Civic Media, Amsterdam University of Applied Sciences, the Netherlands (panel chair);
- Prof. L. De Marez PhD, Associate Professor, Department of Communication Studies; Head research group for Media, Innovation and Communication Technologies, Ghent University, Belgium (panel member);
- Prof. P. Marti PhD, Associate Professor, Department of Social, Political and Cognitive Science, University of Siena, Italy (panel member);
- Prof. D.A.N.M. Kruijt PhD, Professor Emeritus of Development Studies, Faculty of Social and Behavioural Sciences, Utrecht University, the Netherlands (panel member, in particular for the Certificate for Quality in Internationalisation);
- S.C. Jongerius BSc, student Master Industrial and Applied Mathematics, Eindhoven University of Technology, the Netherlands (student member).

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

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

To prepare for the assessment process, the process coordinator/secretary met with programme management to discuss the documents to be presented to the assessment panel, the site visit schedule, and the planning of the preparatory activities. In the course of this process, programme management and the process coordinator/secretary regularly had contact to fine-tune the process.

The activities prior to the site visit were 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 the final projects or graduation project assignments of programme graduates of the two most recent years. Acting on behalf of the assessment panel, the process coordinator/secretary selected fifteen graduation projects from this list. In the selection, projects with lower, average and higher grades were selected. The selection did not contain specialisations, as the programme does not offer specialisations.

In time before the site visit, the panel members were forwarded documents, prepared by programme management. These documents included the self-evaluation report and the appendices to this report. The student chapter was part of the self-evaluation report. The appendices to this report included, among others, the intended learning outcomes, curriculum overview, module descriptions, staff qualifications, figures on intensity of education, and student success rates. The self-evaluation report included references for further reading on specific subjects addressed. Panel members were forwarded a number of final projects of programme graduates with examiners' assessment forms, these being part of the selection made by the process coordinator/secretary. In addition, programme management made available course examinations, Programme Committee minutes and annual reports, Examination Board annual reports, and notes on Covid-measures.

To assist panel members in assessing the programme, they were provided with the Trained Eye WO Limited Framework and CeQuint Framework 2018 document, prepared by Certiked. This document is the elaboration of the NVAO Assessment Framework for the standards of the limited framework and the CeQuint Assessment Framework.

Prior to the site visit date, the assessment panel chair and the process coordinator met to discuss the assessment process procedures. In this meeting, the panel chair was informed about the profile of panel chairs of the NVAO. The panel chair agreed to work in line with the profile of panel chairs.

Seeing the continuing spread of Covid-infections in the Netherlands and the measures taken by Dutch government to counter the spread of infections, programme management proposed the site visit to be organised online. All panel members agreed to the online site visit.

Prior to the date of the site visit, panel members sent in their preliminary findings, based upon their studying the programme documents, as well as questions to be put to programme representatives on the day of the site visit. The panel secretary summarised this information, and compiled a list of questions to serve as the starting point for the discussions with programme representatives during the visit.

Shortly before the site visit date, panel members met to prepare for the site visit. Panel members discussed the preliminary findings about the programme, the questions to be put to programme representatives, and the procedures to be adopted during the site visit.

On 25 March, 2021, the panel conducted the online site visit. The site visit schedule was in accordance with the schedule as planned. The visit schedule included the following meetings.

09.00 – 09.45	Dean Faculty Electrical Engineering, Mathematics and Computer Science and programme director
10.00 – 10.45	Programme director, module coordinators, Programme Committee representative, and study advisor
11.00 – 11.45	Examination Board
11.45 – 12.15	Open office hours
12.15 – 12.45	Panel lunch (closed session)
12.45 – 13.30	Lecturers, final project examiners
13.45 – 14.30	External stakeholders and internationalisation staff
14.45 – 15.05	Presentations by students
15.05 – 15.30	Students, Programme Committee student member, and programme alumni
15.30 – 17.00	Deliberations panel (closed session)
17.00 – 17.30	Main findings presentation by panel chair to programme representatives
17.30 – 18.00	Development dialogue

Open office hours were communicated timely by programme management to staff and students. No persons presented themselves during these open office hours.

In a closed session at the end of the site visit, the panel members considered 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 in broad outline the findings, considerations, conclusions and recommendations to programme representatives. At the end of the day, panel members and programme management met for the development dialogue.

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