Industrial Design Engineering
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FOREWORD

This report is part of the quality assessment of university Bachelor and Master degree courses in the Netherlands. The purpose of this report is to present a reliable picture of the results of the degree courses submitted for this review, to give feedback to the internal quality assurance of the institutes concerned, and to serve as the basis for accreditation of the degree courses by the Accreditation Organisation of the Netherlands and Flanders (NVAO).

The report is written in the English language because of the international composition of the Committee.

The Quality Assurance Netherlands Universities Foundation (QANU) aims to ensure independent, unbiased, critically constructive assessments using standardised quality criteria as far as possible, while taking specific circumstances into account.

The QANU Evaluation Committee Industrial Design Engineering has fulfilled its tasks with great dedication in a period marked by the transition to the Bachelor-Master structure. While the Industrial Design Engineering programme of the Technical University of Delft started some 40 years ago, the Bachelor's programme at both the University of Twente and the Technical University Eindhoven started in 2001, followed later by their Master's programme. The programmes are evaluated in a thorough and careful manner within a clear framework. We trust the judgments and recommendations will be carefully considered by the course providers, the management of the faculties and the boards of the universities concerned.

We thank the Chairman and members of the Evaluation Committee for their willingness to participate in this assessment and for the dedication with which they carried out this task. We also thank the staff of the university departments concerned for their efforts and for their cooperation during the assessments.

Quality Assurance Netherlands Universities

Mr. Chris J. Peels       Dr. Jan G.F. Veldhuis
Director            Chairman of the Board
Preface

This report describes the assessment of the Bachelor’s and Master’s degree programmes in Industrial Design Engineering of the University of Twente, the Delft University of Technology and the Eindhoven University of Technology. The Evaluation Committee reviewed the quality of the educational programmes and processes, focusing on the topics defined in the NVAO assessment framework.

The Evaluation Committee is grateful to the Industrial Design Engineering Departments of the respective universities for their efforts in preparing the self-evaluation reports and providing other documentation about the degree programmes concerned. The information provided in the self-evaluation reports served as a starting point for the assessment process and proved to be of great significance. The Committee appreciated the open, constructive and stimulating discussions with the board, management, staff and students.

The educational programmes provide a challenging and motivating environment in which students are offered an excellent opportunity for education in industrial design engineering. Possible areas for improvement have been recognised by the faculties, and the Committee trusts that the faculty management, departmental staff and students will be working together to further improve the industrial design engineering educational programmes.

As chairman of the Committee, I would like to express my great appreciation for the commitment and the contributions of the Committee members. They showed great interest and dedication in the different stages of the demanding assessment process.

A.C. Rotte,
Chairman of the Committee
PART I: GENERAL PART
1. Administrative data

1.1. University of Twente

Bachelor’s programme:

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<thead>
<tr>
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Master’s programme:

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1.2. Delft University of Technology

Bachelor’s programme:

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### Master's programme:

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1.3. Eindhoven University of Technology

**Bachelor’s programme:**

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**Master’s programme:**

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2. Structure of the report

In this document, the Educational Evaluation Committee for Industrial Design Engineering (referred to hereafter as ‘the Committee’) reports its findings. The report consists of two parts: a general part and an assessment part which contains the results of the educational evaluation of the industrial design engineering degree courses offered at the University of Twente, Delft University of Technology and Eindhoven University of Technology.

The general part summarises the tasks, composition, input documentation and work procedures of the Committee as well as a brief overview of the recent developments in the respective faculty organisations and degree programmes.

The sections describing the evaluation and assessment of the respective educational programmes are structured in accordance with the accreditation criteria prescribed by the NVAO (Accreditation Organisation of the Netherlands and Flanders).
3. General remarks

3.1. Task of the Committee

The task of Committee was to evaluate and assess eight degree programmes in total at three different universities in the period 2000-2005.

University of Twente
Two degree programmes of the Faculty of Engineering Technology:

- the academic Bachelor's programme in Industrial Design Engineering (IDE); three years, CROHO 56955, started in September 2001
- the academic Master's programme in Industrial Design Engineering (IDE); two years, CROHO 66955, started in September 2004

Delft University of Technology
Four degree programmes of the Faculty of Industrial Design Engineering:

- the academic Bachelor's programme in Industrial Design Engineering (IDE); three years, CROHO 56955, started in September 2002
- the academic Master's programme in Integrated Product Design (IPD); two years, CROHO 60354, started in September 2003
- the academic Master's programme in Design for Interaction (DfI); two years, CROHO 60355, started in September 2003
- the academic Master's programme in Strategic Product Design (SPD); two years, CROHO 60356, started in September 2003

Eindhoven University of Technology
Two degree programmes of the Industrial Design Department:

- the academic Bachelor's programme in Industrial Design; three years, CROHO 50441, started in September 2002
- the academic Master's programme in Industrial Design; two years, CROHO 60441, started in September 2004

This evaluation and assessment are based on, and comply with, the accreditation requirements of the Accreditation Organisation of the Netherlands and Flanders (NVAO).

3.2. The constitution of the Committee

A shortlist of candidates was formally approved by the QANU Board on December 21, 2006. The Committee was constituted formally on May 7, 2007. All members of the Committee signed a declaration of independence as required by the QANU protocol to ensure that:

- the panel members judge without bias, personal preference or personal interest, and
- the judgement is made without undue influence from the institute, the programme or other stakeholders.
The Committee consisted of a chairman and six members:

chair
• Mr. Andre C. Rotte, Vice-President Philips Design.

members
• Prof. Farrokh Mistree, Professor of Engineering and Design, Georgia Institute of Technology, Atlanta, USA;
• Prof. Mats E. Hanson, Professor, Department of Machine Design, Mechatronics Division, Royal Institute of Technology (KTH), Stockholm, Sweden;
• Prof. Jaqueline Hellemans, Professor of Physics and Didactics of Physics, K.U. Leuven, Belgium;
• Mrs. Katinka Bergema, student member (IDE TU Delft);
• Mr. Stan Vriezenga, student member (IDE Twente University);
• Mr. Thomas Visser, student member (ID TU/e).

A short curriculum vitae of each of the Committee members is included in Appendix B.

Mr. Peter van Holten, QANU, was appointed secretary of the Evaluation Committee.

3.3. Materials presented to the Committee as a basis for the assessment

The three industrial design engineering faculties offering the degree courses each prepared a self-evaluation report in accordance with the NVAO accreditation criteria\(^1\) and the QANU instructions for the compilation of a self-evaluation report\(^2\). Appended to the self-evaluation reports, the respective faculties provided their 2005/2006 study guides (TU Delft and UT also provided the one for 2006/2007) and lists of the recent Bachelor’s and Master’s theses of the programmes concerned. The Committee selected a total of 30 theses from three Bachelor’s and five Master’s programmes for review and assessment.

Further, the three faculties developed a domain-specific reference frame (DSRK), attached as Appendix C, that was used as the reference frame together with the booklet *Criteria for Academic Bachelor’s and Master’s Curricula*\(^3\).

The self-evaluation documents and the DSRK were sent to the Committee members by mid-February 2007.

Additional information was provided:

• UT: a booklet summarising the 25 Bachelor’s graduation projects since the start of the programme in 2001,
• TU Delft: the draft study guide for the new Bachelor’s programme 2007/2008, and

\(^{1}\) Accreditation protocol for academic educational programmes, NVAO, 14 February 2003.
\(^{3}\) ISBN 90-386-2217-1, NUR 846; Authors: A.W.M. Meijers, C.W.A.M. van Overveld, J.C. Perrenet.
3.4. Working method adopted by the Committee

The Committee used the ‘QANU protocol for the assessment of the Bachelor’s and Master’s programmes’. This QANU protocol is an elaboration of the assessment criteria of the NVAO.

The Committee held a preparatory/inaugural meeting on May 7, 2007. Based on prior study of the self-evaluation reports, the Committee discussed their contents and quality in preparation for the actual visits.

The DSRK is a high-level document in which the three ‘Schools of Industrial Design Engineering’ in the Netherlands have laid down a description of the profile and labour market positions of IDE graduates, some specific features of the IDE curricula and the distinction between the Bachelor’s and the Master’s level. The DSRK, in combination with the booklet Criteria for Academic Bachelor’s and Master’s Curricula, was accepted by the Committee as an adequate framework for the 2007 educational assessment ‘Industrial Design Engineering’.

The Committee decided, in principle, to use all topics, facets and criteria of the QANU protocol.

The University of Twente was visited on May 8 and 9, TU Delft was visited on May 10, 11 and 14, and TU/e was visited on May 15 and 16. Prof. Hellemans attended the visits on May 8, 10,11 and 15. Each of the student members visited one university: Mr. Visser UT, Mr. Vriezenga TU Delft and Mrs. Bergema TU/e. The respective programmes of the site visits are included in Appendix E.

All visits started with a 2-h preparatory meeting. During the first hour, each of the Committee members reviewed a selection of the documentation on display relating to the degree courses under review. The second hour was used for a discussion with the Dean and Director of Education about the mission, vision and strategy of the Faculty for the programmes under evaluation. Interviews with representatives of all relevant entities of the faculty organisation were held subsequently. The Committee interviewed lecturers, students, members of the Education Committee (Opleidingscommissie) and of the Examination Committee (Examencommissie), study coordinators, student coaches and members of the staff (including support staff). Finally, the Committee went on a tour of the laboratories and educational facilities and attended poster sessions of the graduation projects of Bachelor’s and Master’s students. A get-together was organized to meet representatives of the Executive Board and of the faculty management. The afternoon of the last day of each visit was reserved by the Committee for review, to summarise the observations made and to prepare for the close-out meeting. Prior to the close-out meeting, open to all staff and students of the faculty, a no-surprise meeting was held, attended by the Dean, the Managing Director and the Director of Education.

After the site visits a report was drafted by the Committee. The version of the draft report sent for review to the universities was agreed by the Committee after in-depth discussions in a final meeting held on July 9, in Utrecht. This version was submitted to the faculties offering the degree courses for the correction of misinterpretations and factual errors.

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4 QANU protocol for the external quality assessment of academic Bachelor’s and Master’s programmes for accreditation, v3.1, Jan 2004 – Aug 2005.

5 Criteria for Academic Bachelor’s and Master’s Curricula, a joint publication of Delft University of Technology, Eindhoven University of Technology and University of Twente; TU/e 2005, ISBN 90-386-2217-1.
The scores per facet in this report follow the scale prescribed by the NVAO and have the following meaning:

- **Excellent (4)** means that the quality level of this facet is very good in all aspects and withstands international benchmarking. It is an example of best practice.
- **Good (3)** means that the quality level of this facet exceeds expectations and is the result of a well-considered policy;
- **Sufficient (2)** means that the level of this facet meets the basic standard of quality.
- **Insufficient (1)** means that the level of this facet is below the basic standard of quality.

The score ‘Sufficient’ means that all basic requirements for academic education are met and that nothing noteworthy has been observed, either in a positive or in a negative sense, relating to a particular facet.

The scores per facet are summed up on a 2-tier scale (score ‘Sufficient’ or ‘Insufficient’) per topic. In this process an ‘Insufficient’ facet can be compensated by a ‘Good’ or ‘Excellent’ facet under the same topic.

This report is based on an assessment of the period 2001-2006 and is structured in accordance with the accreditation criteria prescribed by NVAO. All assessments are based on the status at the time of the evaluation.

In the case that it is not explicitly stated, the score represents the opinion of the Committee.
PART II: ASSESSMENTS OF THE DEGREE COURSES
General Observations of the Evaluation Committee

Industrial Design Engineering (IDE) is a relatively young discipline compared with the traditional technical academic disciplines like Civil, Mechanical and Electrical Engineering. The combination of the technical and the form-giving/design worlds has resulted in a systematic approach to product development, taking human and consumer factors as well as market research into account.

The three technical universities in the Netherlands, Delft University of Technology (TU Delft), Eindhoven University of Technology (TU/e) and the University of Twente (UT), each teach a Bachelor’s and one or more Master’s degree programmes in Industrial Design Engineering (IDE).

The IDE programme of TU Delft started in 1969, and over 3200 IDE MSc students have graduated since. The IDE Faculty of TU Delft has built an extensive network over the years with other universities, institutions and industry. Its mission is to contribute to the knowledge, skills, methods and professional attitudes in the fields of integrated product development. Design, Technology, User and Business aspects became the four pillars of the IDE programmes.

The ID programme of TU/e and the IDE programme of UT started more recently, in 2001. A few IDE MSc students have graduated from UT, and the first ID MSc students in Eindhoven are expected to graduate soon.

The IDE programmes of UT are very much based on the TU Delft IDE programmes, but differences in focus and emphasis exist. In the Bachelor’s programme, UT focuses on construction engineering and electrical engineering; for the Master’s programme the ‘Emerging Technology Design’ track was developed. With regard to didactics, UT chose amongst others the project-led education model for the Bachelor’s programme. The Industrial Design (ID) Department of TU/e chose to develop their ID degree programmes with a focus on intelligent systems, products, and related services on the basis of a competency-centered education model.

Together the three technical universities in the Netherlands (3TU) have created a huge opportunity to substantially contribute to the development of the body of knowledge of the (new) trans-discipline of Industrial Design Engineering by educating designers for the future. On the other hand, it is of great importance, in the opinion of the Committee, that the existing diversity in vision and focus of the respective faculties is protected. All three universities should assure, by careful monitoring and evaluation of their activities, that a healthy balance is maintained between the teaching effort and the research activities.

The Committee is of the opinion that the self-evaluation reports (SER) thoroughly reflect on the existing status of the educational programmes and related subjects in an open way. The SER reports include summaries of strengths and weaknesses for each topic. Both staff and students contributed to the SER reports.

In general, the Committee members were impressed by the curricula and levels achieved, by the staff, the facilities and the provisions, and by the quality assurance systems of the IDE programmes of the three Dutch universities of technology and by the phenomenal involvement of the students in the quality care and the quality assurance of the IDE programmes of their faculty.
The Committee reviewed a total of 30 theses selected from the summaries of recent Bachelor’s and Master’s theses provided by the universities. About 50% of the theses were rated lower, 40% equal and 10% higher than the rating given by the faculties (programme-specific data can be found under Facet 20 of the respective programmes). The Committee is aware of the fact that their review covered only the thesis document itself, while, for example, the faculties also take into account the academic and professional attitude of the students and the way in which they managed their final project. With respect to the theses reviewed, the Committee is of the opinion that the ‘UT theses’ deal with relatively non-complicated topics and are well done, that the ‘TU Delft theses’ are well structured, and that the ‘TU/e theses’ cover innovative topics. Across the board the use of the English language should be improved.
1. **The Faculty of Engineering Technology, Industrial Design Engineering, University of Twente**

1.1. **Introduction of the Faculty**

Although the University of Twente (UT) investigated the feasibility of starting an academic programme in IDE several times, only on the eve of the new century did the university agree on a solid plan. In April 2001 the first IDE students enrolled in the university. The Bachelor-Master degree system was incorporated from day one. The Faculty of Engineering Technology is responsible for the IDE Bachelor's and Master's programmes. The Mechanical Engineering and Civil Engineering degree programmes are also part of this Faculty. All engineering programmes at UT have, apart from a firm basis in the engineering sciences, a strong focus on the societal implications of technological developments. The Faculty’s slogan is ‘Create the future’, to educate people to change the world by understanding their environment.

1.2. **General reflection of the Committee**

The achievement of the past – pioneering – period is the development and implementation of a complete Bachelor’s and Master’s degree programme for IDE with strong roots in the engineering sciences, both mechanical and electrical. Through these roots the UT IDE programmes distinguish themselves from those of TU Delft and TU/e. The Committee feels that further development of the vision, direction and opportunities will lead to the creation of their own brand/image for the UT IDE programmes. This would justify the position of the UT IDE programmes alongside the TU Delft IDE and TU/e ID programmes.

The UT IDE programmes are relatively young, and the teaching staff are obviously highly motivated to make the programmes successful. As a consequence, the focus on teaching is very strong, and close contact exists between the teachers and students. However, the number of tenured staff for IDE is still rather limited. The Committee perceives that the strong focus on teaching and the wide availability of the staff are currently maintained by the strong drive and at the expense of research activities. Once a better balance is achieved between teaching and research in the future, the staff research output should increase and be fed back into education.

Internationalization and external contacts are at this stage not yet formally structured and are excluded from the scope of this evaluation.

At the level of the university organisation, the Committee identified a rather unique matrix organisation of faculties and institutes, in which education is primarily the responsibility of the faculty and research is primarily the responsibility of the institutes. The Committee wonders whether this governance structure is the best way to balance the teaching and research activities and to ensure that students acquire knowledge at the interface of teaching and academic research.
1.3. The assessment Protocol UT BSc IDE

1.3.1. Objectives of the degree courses (Topic 1)

**F1: Domain-specific requirements**
The final qualifications of the degree course correspond to the requirements made to a degree course in the relevant domain (field of study/discipline and/or professional practice) by colleagues in the Netherlands and abroad and the professional practice.

Industrial Design Engineering (IDE) is part of the new Faculty of Engineering Technology. This Faculty formulated its aim and mission in a strategic plan in 2005. The mission of the education programmes is at the heart of this strategy:

“The faculty aims to educate IDE academics at the Bachelor, Master and PhD levels for those typical sectors of the labour market within the field of engineering technology. The graduates will be prepared for the positions of tomorrow, and therefore will have a profound orientation on the newest knowledge and methods within this field and also will have the attitude and learning competency for functioning in adjacent fields at short notice. The graduates should have a level of competency equivalent to that of well-reputed universities in western countries.

This aim requires a strong link between education and research. For the Bachelor and Master programmes, research provides both the point of view as well as the scientific environment essential for the education of an academic engineer.

Typical for the programmes is the emphasis on design, on interdisciplinarity, and on the development of competences beyond the technical field.”

Within this mission the faculty has chosen the slogan “Create the future” for the education of people to change the world by understanding their environment.

Although the link with the professional field in the above vision is not very explicit, a group of representatives of the professional field was invited to reflect on the set-up of the IDE programmes.

It is the opinion of the Committee that the vision is not yet fully embedded in the core thinking of the Faculty, but as the IDE programmes of the Faculty and its vision are still relatively young, the communication of the Faculty's vision is in progress.

The IDE programmes of the University of Twente (UT) have their basis – more or less – in the Mechanical Engineering domain. This, in combination with the link to the UT human science programmes, forms a strong mental model and constitutes a huge opportunity for the future development of the IDE programmes, provided the potential of synergy between the different programmes and the link with Electronic and Computer Sciences is recognised.

From the Faculty’s aims and objectives, seven competency areas for the IDE graduate are distinguished and formally documented in the Education & Examination Regulations.
The IDE programmes (within the Delft University of Technology, Eindhoven University of Technology and University of Twente) have laid down the competencies and labour market positions of IDE graduates and the distinction between Bachelor’s and Master’s level in a common domain-specific reference frame (DSRK).

Delft University of Technology (TU Delft) decided to perform an international benchmark survey of their IDE Bachelor’s and Master’s programmes in 2005. The benchmark survey revealed that the TU Delft Bachelor’s programme stands out with respect to the emphasis on design methodology, sustainability and the balance between formgiving and design engineering. Moreover the attention given to ergonomics, market, consumer and organisation is fairly unique. The qualifications for the UT IDE Bachelor’s programme do not differ much from those for TU Delft. Therefore, it can be concluded that the achievement level of the UT IDE Bachelor’s programme corresponds to the requirements made of similar degree courses in the relevant domain by colleagues in the Netherlands and abroad.

The score for this Facet is ‘Sufficient’.

F2: Level
The final qualifications of the degree course correspond to general, internationally accepted descriptions of the qualifications of a Bachelor or a Master.

The achievement levels of the UT IDE programmes have been defined in line with the booklet *Criteria for Academic Bachelor’s and Master’s Curricula*. These criteria are formally accepted by NVAO as a more expanded and relevant statement of the Dublin Descriptors, which must be respected as required by the QANU protocol. By having developed and implemented these criteria, the three Dutch universities of technology stand out positively from other universities in the Netherlands.

The criteria describe, in detail, the distinction in level between academic Bachelor’s and Master’s degrees, and also the range of intellectual attributes and understanding of contexts that a trained engineer may require, depending on career direction. Therefore, these criteria are more suitable for a specific qualitative examination of the Bachelor’s and Master’s programmes concerned than the Dublin Descriptors.

As the formulation of the UT IDE Bachelor’s programme achievement levels is largely based on the *Criteria for Academic Bachelor’s and Master’s Curricula*, compliance with the Dublin Descriptors is assured.

Based on the analysis performed by the Faculty and the verification carried out by the Committee, it can be concluded that the final qualifications of the degree courses meet the requirements laid down in the Dublin Descriptors.

The score for this Facet is ‘Good’.
The final qualifications (competencies) match the requirements of the national academic discipline, the international academic practice and the prospective professional field as described under Facets 1 and 2 above.

The Bachelor’s degree gives unconditional access to the appropriate Master’s programmes of the three technical universities (3TU) in the Netherlands. Moreover, IDE BSc graduates have access to several other engineering programmes for which a specific minor is sometimes required. In total, IDE BSc graduates are admitted to some 12 engineering Master’s programmes in the Netherlands. The admission criteria are regulated in a 3TU admission matrix.

No evidence is available yet about the value of the Bachelor’s degree for direct entrance to the labour market, as no BSc graduates have applied for a job directly after graduation.

Preparation for a career in a professional environment is not yet included in the programme objectives of the Bachelor’s programme, which is in line with the advice obtained from representatives of the professional field. In this respect, the European developments about the status of the BSc graduate should be carefully monitored.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 1 is ‘Sufficient’.

1.3.2. Programme (Topic 2)

Within the Bachelor’s programme the interaction between education and research is established by the teaching staff, most of whom are active in research. Although many of the theory courses in the first and second year are an introduction in a new discipline, new theories will be introduced by the lectures. In project-related courses, students will gradually be confronted with new developments in engineering science.
The second and third year courses ‘Research Methods’ and ‘Introduction to Technological Research’ further acquaint the students with research. Especially in the ‘Design and Consumer Products’ group project and the ‘Design and Human Factors’ group project, the link with research is very clear.

The external network is only systematically used in the graduation assignment for receiving feedback from the professional field on the learning objectives and programme requirements. The feedback is used to evaluate the programme. Guest lecturers from design firms or industrial companies are often involved in projects and specialist courses.

The Committee invited the BSc teachers interviewed to reflect on a case in which they were to invest a substantial sum of money in the Faculty. The BSc teachers responded that they would choose to invest in more staff to enable the execution of more research activities whilst maintaining the level of educational activities. However, it seems that the university budget system does not facilitate the required strong interconnection between research and education in the way envisaged by the teachers of the Bachelor’s programme. The Faculty does not manage the research budget. At UT the management of research budgets is the prerogative of the research institutes. The different governance models for research and education are being tested and will be evaluated at the end of 2007.

The score for this Facet is ‘Sufficient’.

F5: Relationship between aims and objectives and contents of the programme

- The course contents adequately reflect the final qualifications, both with respect to the level and orientation, and with respect to domain-specific requirements.
- The final qualifications have been translated adequately into learning targets for the programme or its components.
- The contents of the programme offer students the opportunity to obtain the final qualifications that have been formulated.

The objective of the Bachelor’s programme is to educate an industrial design engineer who can operate in the field of IDE as an interdisciplinary designer.

In support of its objective, the Faculty has chosen the slogan “Create the future” for the education of people to change the world by understanding their environment. Consequently, the programme educates the student in the fields of science and technology, manufacturing and logistics, market and user, business and marketing, aesthetics and functionality, and human sciences, thereby focussing on integrating these fields in the development of solutions.

All first, second and third year courses and projects have defined learning goals. The Committee is of the opinion that the course contents are adequate to achieve the defined course objectives.

By mapping the courses and projects (or their contents) against the competencies to be developed, the Faculty has demonstrated that the final qualifications are achieved by successful completion of the Bachelor’s programme. Some students expressed the opinion that the scope of specific projects was too wide, although relevant in hindsight (e.g. project 2).
The majority of the IDE BSc students prefers to arrange their own minor. The IDE Examination Committee (EC) has to assure the achievement of the final qualifications in all competency areas for any IDE BSc graduate. Therefore, IDE students with good results during the first two years are free to choose an accredited minor. On the other hand, students with poor results need the approval of the EC for their choice of minor. The EC ensures that the minor chosen contributes to the personal development and also to the professional development of the student.

Project groups consist of 4 – 8 students, and each project group is guided by a tutor. The group provides the student with a range of professional and communication skills essential in the modern professional environment. The group processes (dynamics) are not yet evaluated as part of the learning process.

UT developed an honours track (HT) programme for talented students from all faculties. Such students may do an additional programme on top of the Bachelor programme. The HT programme is intended to further expand the Bachelor study for example in preparation for a Master study or PhD study or to broaden knowledge and skills for a job in industry. From the 2006/2007 course year onwards, talented IDE students are encouraged to join the HT programme.

The score for this Facet is ‘Sufficient’.

**F6: Coherence of the programme**

Students follow a programme of study that is coherent in its contents.

The project-led education (PLE) philosophy has been adopted to ensure an adequate preparation of the BSc students for positions as industrial design engineers on the labour market, and to optimise learning effectiveness. A generally recognised strength of this philosophy is its coherence. In PLE the students start designing from their first day onwards. In this way they experience the need for theory and skills and learn to evaluate their usefulness. Coherence is evident in every period. Bachelor’s and project coordinators monitor the coherence of the periods and of the programme as a whole. The Committee recognizes the strength of the PLE philosophy through which all relevant competency areas are addressed, the education programme built on the basis of PLE, and the monitoring role of the Bachelor’s and project coordinators in assuring programme coherence.

The students interviewed confirmed that courses and projects form a coherent programme. The coherent PLE structure is ‘interrupted’, however, by the minor in the first semester of the third year programme. The minor is usually a course – in itself coherent – offered by one of the other programmes of UT.

Some of the students interviewed complained about the uneven distribution of technically oriented and design-oriented courses in the second Bachelor’s year.

The score for this Facet is ‘Sufficient’.
F7: Study load
The programme can be successfully completed within the set time, as certain programme-related factors that may be an impediment to study progress are removed as much as possible.

At the programme level the study coordinator monitors the actual against the planned study load. The study load has been regularly evaluated, and only incidentally did the actual study load exceed the planned maximum study load of 45 hours per week. The Faculty uses two tools for review of the study load as perceived by the student: the course evaluation and the timekeeping survey.

A substantial number of the students do not keep up with the programme. They make up their own programme which does not support the learning in an optimal way. In many cases the number of hours spent on study per week – 35 hours on average – is less than the recommended number of hours.

The Bachelor’s programme includes an orientation on scientific research and an end-of-programme individual project, which demonstrates the ability to work independently at the Bachelor’s level.

The score for this Facet is ‘Sufficient’.

F8: Intake
The structure and contents of the programme are in line with the qualifications of the students that embark on the degree course:

• Bachelor’s degree at a University (WO): VWO (pre-university education), propaedeutic certificate from a University of Professional Education (HBO) or similar qualifications, as demonstrated in the admission process.
• Master’s degree at a University (WO): bachelor’s degree and possibly selection (on contents of the subject).

The intake in the Bachelor’s programme consists almost exclusively of students who recently completed their secondary school education with Maths and Physics as majors at the highest level in their profiles. Some 15% of the BSc intake students come from a different university programme.

Students with the secondary school profile Life Sciences often have Maths and Physics at the first level only. These students have to take Maths classes during the first semester of the first year. These classes are not additional to the programme, but substitute for part of the initial projects. In this respect the Faculty would like to have the possibility ‘to select at the gate’, but selection on the basis of competencies is not allowed by Dutch law.

Information about the Bachelor’s programme is available on the web and via education fairs. Four times a year the university welcomes prospective students. The main part of the programme is specific, i.e. about the IDE Bachelor’s programme. Finally, prospective students can participate in a ‘trial day’ (‘meeloopdag’).

The score for this Facet is ‘Sufficient’.
F9: Duration
The degree course complies with formal requirements regarding the size of the curriculum:
• Bachelor of a University (WO): 180 credits as a rule.
• Master of a University (WO): a minimum of 60 credits, dependent on the relevant degree course.

The Bachelor’s curriculum has a study load of 180 European Credits (one EC nominally corresponds to 28 hours of study) and a nominal study duration of 3 years.

The curriculum size of the Bachelor’s programme is in accordance with the European Credit Transfer System (ECTS).

The score for this Facet is ‘Sufficient’.

F10: Coordination of structure and contents of the degree course
• The didactic concepts are in line with the aims and objectives.
• The teaching methods correspond to the didactic concept.

As mentioned before under Facet 6, the project-led education (PLE) philosophy has been adopted to ensure an adequate preparation of the students for positions as industrial design engineers on the labour market, and to optimise learning effectiveness. In PLE the students start designing from their first day on. In this way they experience the need for theory and skills and learn to evaluate their capacities. The PLE concept is supported by the multifunctional classroom where reading, group work, individual practice and lectures take place. Having their own workspace stimulates student engagement, ownership, working regular office hours and the development of a professional attitude.

The projects, in general, are conducted in parallel with supporting courses and theory classes for e.g. Maths, Mechanics and Control.

The third year programme is largely individual, in comparison with the first two years. The students choose a minor, carry out a graduation project and deepen their engineering and social science knowledge.

The score for this Facet is ‘Sufficient’.

F11: Assessments and examinations
The system of assessments and examinations provides an effective indication whether the students have reached the learning targets of the course programme or its components.

The Faculty’s policy regarding the assessment of student performance and the examination and assessment procedures are defined and documented in the Education and Examination Regulations (EER).

Given the variety of competencies to be assessed and of educational concepts, several methods of measurement are applied. Most of the theory courses are assessed using written examinations. Oral examinations are used for the courses with a substantial skills and/or integration component. The assessment of projects is based on the results of the group and on an
individual assessment. The assessment of the group reduces in favor of the assessment of the individual, going from one project (the first) to the next project up to the last Bachelor’s project.

Since 2004/2005 the students have also had to reflect on their development process and results by keeping a Visual Process Report (Sketchbook), reminding them at the same time to keep their visualization skills up-to-date. The ‘Sketchbook’ is now formally included in the assessment procedure.

The examination of the Bachelor’s graduation project comprises an assessment of the written report, a closed session in which the candidate is examined by the Assessment Committee (AC) and a presentation of the work to a public audience.

The assessment criteria for examinations are well defined and documented. The regulations are transparent and accepted by the students, who are familiar with them.

Occasionally, a student or student group submits an appeal to the Examination Committee in relation with an assessment. Appeals are dealt with in accordance with the EER procedures.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 2 is ‘Sufficient’.

1.3.3. Deployment of staff (Topic 3)

F12: Requirements for University
The degree course meets the following criteria for the deployment of staff for a degree course at a University (WO):
Teaching is largely provided by researchers who contribute to the development of the subject area.

Nearly all scientific staff are involved in the various research programmes of the university research institutes such as IMPACT, CTIT, BMTI and IGS. The target for scientific staff is a 40/40/20% distribution between education, research and overhead.
From the first year on, students come into contact with academic and professorial role models; more than 50% of the teaching staff have a PhD and/or professorship.

The number of scientific publications, and thus the evidence of having created new knowledge, is relatively low. This situation is probably caused by the high teaching load of the academic staff as discussed under Facet 13 below.

The score for this Facet is ‘Sufficient’.

F13: Quantity of staff
The staff levels are sufficient to ensure that the course is provided to the required standards.

Currently 9.99 fte of IDE staff is available for IDE education versus a total of 23.60 fte. When the staff from other faculties teaching in the IDE programmes is included as well, 11.98 fte is
available for education. Currently, the student to staff ratio for IDE amounts to 29.2 including the external fte from other faculties.

The staff is experiencing an increasing demand for education with rising student numbers. When asked, the BSc teachers confirmed that they would choose to invest in more staff to enable more research activities whilst maintaining the same level of educational activities. The Master’s programme teachers, in turn, would mainly choose to invest in facilities that support the research.

Many staff members admit that they spend more time on their educational duties than the normative time. In other words, the relatively high teaching load is sustained by a high commitment. The Faculty has recognised this problem, and 4.3 fte of additional staff are envisaged in its 2007 budget proposal.

Generally speaking, the demands and pressure have increased to a level at which the staff are fully occupied. Without re-appraising priorities, further teaching demands cannot be accommodated.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F14: Quality of staff</th>
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<tbody>
<tr>
<td>The staff is sufficiently qualified to ensure that the aims regards contents, didactics and organization of the course programme are achieved.</td>
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</table>

The teachers are well motivated and prepared for their teaching duties, with respect to both their field of expertise and the required teaching skills. Now the bachelor’s programme is fully implemented, a next step for the faculty should be to further strengthen the research orientation of the IDE Bachelor’s teachers.

The majority of the teaching staff has a PhD degree or is working on a PhD thesis.

The range of expertise available suffices for handling most of the content of the Bachelor’s programme. The remaining content is covered by specialist courses from design firms and industrial companies.

Didactic skills are part of the assessment of new staff and of the annual ‘functioning evaluation and performance review’ of tenured staff.

Since 1994 it has been the University’s policy to enter newly appointed staff members with teaching duties in educational upgrading programmes. In general, new assistant and associate professors participate in the Didactic Training Course for University Personnel (DUIT); this course has a workload of 250 hours. Staff members who successfully complete the DUIT programme receive the ‘basic qualification for education’. Six universities in the Netherlands mutually recognize each other’s basic qualifications in this respect. For full professors, a short refresher course exists.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 3 is ‘Sufficient’.
1.3.4. Facilities and provisions (Topic 4)

**F15: Material facilities**
The accommodation and material facilities are sufficient to implement the programme.

First- and second-year students use the modernised multifunctional classroom facilities in the faculty building. These students - and staff members - are positive about the concept of multifunctional classrooms.

The third-year students have to share a room with other groups because they follow a minor in another faculty and conduct a graduation assignment outside the university, and are therefore at the Faculty at most one-third of the time. Hence, a permanent multifunctional classroom concept is not feasible for these students. According to some third-year students, who consider the shared rooms problematic, more ‘studio-type’ facilities are needed for third-year groups.

First-year students purchase a laptop and various professional software packages from the university at a competitive price, and they can apply for a term of repayment lasting 24 months without interest. A maintenance service is available free of charge. Wireless access to the Internet and servers is available everywhere in the Faculty building and on the campus.

Through the portal ‘My Campus’, students have access to all electronic services of the University and of the Faculty as well as to course information, the system to register for exams or to retrieve exam results, and to the electronic learning environment TeleTOP. Through TeleTOP, teachers inform students about the details of the schedule, course supporting material like hand-outs, sheets and feedback on exercises.

The students consider the ICT facilities adequate.

The score for this Facet is ‘Sufficient’.

**F16: Student support and guidance**
- The student support and guidance, as well as the information given to students are adequate for the purpose of students’ progress.
- The student support and guidance, as well as the information given to students meet the requirements of the students.

Each student is allocated to a mentor. In the first year the mentor takes the initiative for meeting the student. Gradually, the initiative is taken over by the students, but the mentor remains available for advice and consultation during the second and third year. The mentor is a member of the first-year examination advisory committee. New mentors participate in a short counselling training course organised at the UT level. Mentors meet to discuss student problems in general terms and to formulate feedback to the programme coordinator.

Growing student numbers cause some concern about the sustainability of the mentor/counselling system in the future.

Counselling is supported by a system for student progress. Because the software for the system is no longer up to date, this support is time-consuming and inadequate. The Faculty is developing a temporary support tool for counselling.
The tutor is a staff member guiding the student project groups who interacts intensively with the students during the first half of the Bachelor’s programme.

After the first year students receive written advice about their potential to successfully complete the IDE programme. At the end of the first year, nearly 15% of the students are recommended to consider a career outside the IDE programme. About 45% of those students take the advice seriously and discontinue their IDE study.

In the recent years, with many renovations and relocations in progress, the information provided to students was not always adequate and on time. Now the situation has stabilised and improved. Student members of the Education Committee and the Evaluation Committee confirmed that the information is adequate, meets the requirements of the students and is on the Internet.

The students are formally informed about their study progress twice a year. Through the portal ‘My Campus’, students have access to the system to register for exams and to retrieve exam results.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 4 is ‘Sufficient’.

1.3.5. Internal quality assurance (Topic 5)

<table>
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<tr>
<th>F17: Evaluation of results</th>
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The degree course is subject to a periodic review, which is partly based on verifiable targets.

The Internal Quality Assurance (IQA) System applied to the IDE programme is a system of the Engineering Technology (CTW) Faculty. Thus, the same IQA system is used for the Civil Engineering and Mechanical Engineering programmes offered by the Faculty. The IQA system demonstrates innovative thinking about quality care and quality control and offers a structured approach for the monitoring and review of Outcome, Product, Output and Process of the IDE Bachelor’s and Master’s programmes. Reference groups are used to ensure meaningful and comparable data over the years.

Both the Bachelor’s and the Master’s programmes are evaluated systematically. Each course and the period (trimester) are subject to evaluation. Courses are evaluated once per 3 years, with responses up to 80%. The trimester (period) evaluation consists of a summary of the course evaluations and specific evaluation subjects. It is noted that the new courses are not evaluated in such a systematic way from their outset. In the first year, the emphasis is on monitoring and direct improvement of the education process (feed forward). The annual evaluation has yet not been carried out. Such an evaluation will focus on the reconciliation of course evaluations and result (output) figures. The Bachelor’s programme evaluation has been carried out once and is awaiting a new cohort.

A reflective self-evaluation report, presenting a clear summary of strengths, weaknesses, dilemmas and actions for each topic of the assessment protocol, is one of the products of the IQA system.
Criteria have been defined for the IDE BSc and MSc graduates in terms of the levels they should have achieved for each of the seven competency areas as a result of the education process.

Targets have been defined for the quantitative results of the Bachelor’s and the Master’s education processes.

When in future the Bachelor’s evaluation is repeated and executed in full and its effectiveness is proven, a higher score than Sufficient could well be expected.

The score for this Facet is ‘Sufficient’.

<table>
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<th><strong>F18: Measures to effect improvement</strong></th>
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<tbody>
<tr>
<td>The results of this evaluation form the basis for measures that can be demonstrated to improve the course and that will contribute to reaching the targets.</td>
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</table>

Where evaluations show results to be below the targets, follow-up procedures are applied. The initiative for follow-up rests with the DoE or the Bachelor Coordinator. The effects of the measures are again reviewed by the Evaluation Committee and monitored by the Education Committee. For example, ‘Unsatisfactory’ course evaluation outcomes are fed back to the teacher(s) concerned and evaluated again the next year.

The score for this Facet is ‘Sufficient’.

<table>
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<tr>
<th><strong>F19: Involvement of staff, students, alumni and the professional field</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff, students, alumni and the professional field in which graduates of the course are to be employed are actively involved in the internal quality assurance.</td>
</tr>
</tbody>
</table>

Teaching staff and students are actively involved in all phases of the quality assurance process. The Disciplinary Council (education staff) and the Education Committee approved the IQA planning, the evaluation methods and the targets set.

The external network is only systematically used for providing feedback on the learning objectives and the programme requirements in the final assignment. The feedback is used to evaluate the programme.

The professional field will be involved through the WO-monitor (alumni) as soon as some fifty IDE MSc graduates have found employment in the market.

The score for this Facet is ‘Sufficient’.

**The overall score for Topic 5 is ‘Sufficient’**.
1.3.6. Results (Topic 6)

<table>
<thead>
<tr>
<th>F20: Level that has been achieved</th>
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</table>
The final qualifications that have been achieved correspond to the targets set for the final qualifications in level, orientation and domain-specific requirements.  

The Committee reviewed six Bachelor's theses as part of this evaluation. In 50% of the cases, the scores awarded by the Committee were lower than the scores awarded by the Faculty. The Committee realises, however, that their review of a selection of theses is only part of the full final assessment of the competencies achieved by a particular student. Based on the theses reviewed, the Committee is of the opinion that the graduates have achieved the final qualifications. The use of the English language in the theses should be improved.

The score for this Facet is ‘Sufficient’.

<table>
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<tr>
<th>F21: Success rates</th>
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To measure the success rates, target figures have been set in comparison with relevant other degree courses. The success rates meet these targets.  

The Bachelor’s programme has explicit target figures with regard to student progression rates at the programme and course level as well as with regard to the drop-out rate in the first Bachelor’s year. To produce consistently comparable output figures, reference groups are formed on the basis of which the numerical results are obtained.

The pass rates per course are acceptable. The drop-out and first- and second-year progression rates are also acceptable. The third-year Bachelor's progression rates are below target, however: only about half the reference group completes 75% of the nominal programme in the third year. The overall pass rate of the Bachelor's programme is also substantially below target: less than 50% of the reference group completes the Bachelor's programme within 4 years, whereas the target is 75%. This can be explained partly by the fact that students do not follow the full programme load each year, which is due largely to personal choices and priorities made by the students in terms of e.g. taking a job, organising student associations and therefore spending fewer than the recommended number of study hours per week. It is noted here that the progression rates of the female students as a sub-cohort do meet the Faculty’s targets.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 6 is ‘Sufficient’.
1.4. The assessment Protocol UT MSc IDE

1.4.1. Objectives of the degree courses (Topic 1)

<table>
<thead>
<tr>
<th>F1: Domain-specific requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications of the degree course correspond to the requirements made to a degree course in the relevant domain (field of study/discipline and/or professional practice) by colleagues in the Netherlands and abroad and the professional practice.</td>
</tr>
</tbody>
</table>

Industrial Design Engineering (IDE) is part of the new Faculty of Engineering Technology. This Faculty formulated its aim and mission in a strategic plan in 2005. The mission of the education programmes is at the heart of this strategy:

“The faculty aims to educate IDE academics at the Bachelor’s, Master’s and PhD levels for those typical sectors of the labour market within the field of engineering technology. The graduates will be prepared for the positions of tomorrow, and therefore will have a profound orientation on the newest knowledge and methods within this field and also will have the attitude and learning competency for functioning in adjacent fields at short notice. The graduates should have a level of competency equivalent to that of well-reputed universities in western countries.

This aim requires a strong link between education and research. For the Bachelor’s and Master’s programmes, research provides both the point of view as well as the scientific environment essential for the education of an academic engineer.

Typical for the programmes is the emphasis on design, on interdisciplinarity, and on the development of competencies beyond the technical field.”

Within this mission the faculty has chosen the slogan “Create the future” for the education of people to change the world by understanding their environment.

Although the link with the professional field in the above vision is not very explicit, a group of representatives of the professional field was invited to reflect on the set-up of the IDE programmes.

It is the opinion of the Committee that the vision is not yet fully embedded in the core thinking of the Faculty, but as the IDE programmes of the Faculty and its vision are still relatively young, the communication of the Faculty’s vision is in progress.

The IDE programmes of the University of Twente (UT) have their basis – more or less – in the Mechanical Engineering domain. This, in combination with the link to human science programmes of the UT, forms a strong mental model and constitutes a huge opportunity for the future development of the IDE programmes, provided the potential of synergy between the different programmes and the link with Electronic and Computer Sciences is recognised.

From the Faculty’s aims and objectives, seven competency areas for the IDE graduate are distinguished and formally documented in the Education & Examination Regulations.
The IDE programmes (within the Delft University of Technology, Eindhoven University of Technology and University of Twente) have laid down the competencies and labour market positions of IDE graduates and the distinction between Bachelor’s and Master’s level in a common domain-specific reference frame (DSRK).

Delft University of Technology (TU Delft) decided to perform an international benchmark survey of their IDE Bachelor’s and Master’s programmes in 2005. The benchmark survey revealed that only a few institutes seriously developed an IDE Master’s programme. Like the TU Delft IDE master’s programmes, all comparable programmes appear to opt for a multidisciplinary approach with designing at the centre. Points in which the TU Delft Master’s programmes stand out are listed under facet 1 in the sections concerned. The qualifications for the UT IDE Master’s programme do not differ much from those for TU Delft. Therefore, it can be concluded that the achievement levels of the UT IDE Master’s programme correspond with the requirements made of similar degree courses in the relevant domain by colleagues in the Netherlands and abroad.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F2: Level</th>
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</thead>
<tbody>
<tr>
<td>The final qualifications of the degree course correspond to general, internationally accepted descriptions of the qualifications of a Bachelor or a Master.</td>
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</tbody>
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The achievement levels of the UT IDE programmes have been defined in line with the booklet *Criteria for Academic Bachelor’s and Master’s Curricula* (2nd edition, Jan. 2005). These criteria are formally accepted by NVAO as a more expanded and relevant statement of the Dublin Descriptors, which must be respected as required by the QANU protocol. By having developed and implemented these criteria, the three Dutch universities of technology stand out positively from other universities in the Netherlands.

The criteria describe in detail the distinction in level between academic Bachelor’s and Master’s degrees, and also the range of intellectual attributes and understanding of contexts that a trained engineer may require, depending on career direction. Therefore, these criteria are more suitable for a specific qualitative examination of the Bachelor’s and Master’s programmes concerned than the Dublin Descriptors.

As the formulation of the UT IDE Master’s programme achievement levels is largely based on the *Criteria for Academic Bachelor’s and Master’s Curricula*, compliance with the Dublin Descriptors is assured.

Based on the analysis performed by the Faculty and the verification carried out by the Committee, it can be concluded that the final qualifications of the degree courses meet the requirements laid down in the Dublin Descriptors.

The score for this Facet is ‘Good’.
**F3: Orientation**

The final qualifications of the degree course correspond to the following descriptions of a Bachelor and a Master at universities:

- The final qualifications are based on requirements made by the academic discipline, the international academic practice and, if applicable to the course, the relevant practice in the prospective professional field.
- A University (WO) bachelor possesses the qualifications that allow access to a minimum of one further University (WO) degree course at master's level as well as the option to enter the labour market.
- A University (WO) master possesses the qualifications to conduct independent academic research or to solve multidisciplinary and interdisciplinary questions in a professional practice for which a University (WO) degree is required or useful.

The final qualifications (competencies) do match the requirements of the national and international academic discipline and the prospective professional field as described under Facets 1 and 2 above.

Since only a few Master's students (7) have graduated to date, no reliable evidence is yet available that the MSc graduates possess the qualifications to conduct independent academic research or to solve multidisciplinary and interdisciplinary questions and about the value of the Master's degree for the labour market. However, the Committee expects that the Master's programme reviewed provides the student with the final qualifications set by the academic discipline and the professional field.

The score for this Facet is ‘Sufficient’.

**The overall score for Topic 1 is ‘Sufficient’**.

**1.4.2. Programme (Topic 2)**

**F4: Requirements for university degree courses**

The programme meets the following criteria applicable to a degree programme at a University (WO):

- The students acquire knowledge on the interface between teaching and academic research within the relevant disciplines;
- The programme follows the developments in the relevant academic discipline(s), as it is demonstrated that it incorporates current academic theories;
- The programme ensures the development of skills in the field of academic research;
- For those courses for which this is applicable, the course programme has clear links with the current professional practice in the relevant professions.

MSc students continue their studies in one of three Master's tracks: Design & Styling (D&S), Emerging Technology Design (ETD), and Management and Product Development (MPD). The requirements and options are discussed, enabling the Master's student to draft a Master's programme. The programme is approved by the chair holder and submitted to the Examination Committee (EC) that monitors the consistency between the Master's programmes of different students.

The IDE Master's programme is based on compulsory and recommended courses like design, professional design, engineering, business and humanities. Nearly all courses in the Master's programme have links with research and with the science-based design practice. Many Master's assignments have strong links with the professional practice and are partly conducted in research institutes or companies where the staff are involved in the supervision.
Most graduation projects are conducted within or linked to recognised research groups inside or outside the Faculty.

Within the Master’s programme the interaction between education and research is established by the teaching staff, most of whom are active in research. New theories will be introduced by the lecturers. Guest lecturers from design firms and industrial companies are often involved in projects and within specialist courses. Some of the students interviewed showed a limited understanding of the research programmes carried out in the Master’s track they had chosen and would like more interaction in that respect. Moreover, some students lacked a clear view about their own future in the field of IDE.

The external network is not systematically used yet for providing feedback from the professional field on the learning objectives and programme requirements.

The Committee invited the MSc teachers interviewed to reflect on a case in which they could invest a substantial sum of money in the Faculty to comply with the university requirements with respect to academic research. The teachers responded that they would choose to invest in facilities that support research. It is noted here that the Bachelor’s programme teachers asserted that they would choose to invest in more staff to enable more research activities whilst maintaining the level of educational activities.

The university budget system does not facilitate the required balance between research and education in the way envisaged by the teachers. At UT the management of the research budgets is the prerogative of the research institutes rather than of the faculties. These separate governance models for research and education are being tested and will be evaluated at the end of 2007.

The score for this Facet is ‘Sufficient’.

**F5: Relationship between aims and objectives and contents of the programme**

- The course contents adequately reflect the final qualifications, both with respect to the level and orientation, and with respect to domain-specific requirements.
- The final qualifications have been translated adequately into learning targets for the programme or its components.
- The contents of the programme offer students the opportunity to obtain the final qualifications that have been formulated.

The objective of the Master’s degree programme is, just like for the Bachelor’s programme, to educate an industrial design engineer who can operate in the field of IDE as an interdisciplinary designer.

In support of its objective, the Faculty has chosen the slogan “Create the future” for the education of people to change the world by understanding their environment. Consequently, the programme educates the student in the fields of science and technology, manufacturing and logistics, market and user, business and marketing, aesthetics and functionality, and human sciences, thereby focussing on integrating these fields in the development of solutions.
The difference between the BSc and the MSc graduates can be found in orientation and level. Typically, the MSc graduate is able to apply knowledge in new, non-standard situations and to manage more complex and poorly structured problems independently and autonomously.

All first- and second-year Master’s courses have defined learning goals. It is the opinion of the Committee that the course contents are adequate to achieve the defined course objectives. By specifying which courses are compulsory and which courses are strongly recommended for each track in the Master’s programme, in addition to the graduation project and a few optional subjects, the Faculty has demonstrated how the final qualifications are achieved upon successful completion the Master’s programme.

The graduation project concludes the Master’s curriculum. It is an individual project undertaken in one of the university laboratories or in a design firm or industrial company, provided adequate supervision is ensured. The aim of the graduation project is to give students the opportunity to demonstrate their abilities in applying their knowledge and skills acquired during the preceding years in an adequate way and at an appropriate level. The graduation project is often embedded in a broader research or design study, with a researcher or experienced engineer as supervisor. The student takes the initiative for proposing the subject and content of the graduation project. The chair holder is responsible for the level and coherence of the students’ programme and for the assignment of a daily supervisor for the graduation project.

Because the Master’s programme was implemented for the first time in the academic year 2004/2005, no substantial evidence is available yet that the Master’s programme tracks described realise the final qualifications. However, the Committee expects, on the basis of the verification carried out, that the programme offers the opportunity to obtain the final qualifications.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F6: Coherence of the programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students follow a programme of study that is coherent in its contents.</td>
</tr>
</tbody>
</table>

The PLE approach is not continued in the Master’s programme. Projects in the Master’s programme are very much related to actual cases.

For a specific competency area, coherence is realised by the design of the group of courses for the development of that particular area, while within the specialisation track, the Course Coordinator for that particular track is responsible for a coherent study programme. The Committee recognises the key role of the Course Coordinator in the development and maintenance of a coherent study programme.

The Committee is of the opinion that the Faculty has been successful in presenting a programme of equally well developed courses covering research, design, user, manufacturability and profitability.

The students interviewed confirmed that the courses and projects form a coherent programme.

The score for this Facet is ‘Sufficient’.
**F7: Study load**
The programme can be successfully completed within the set time, as certain programme-related factors that may be an impediment to study progress are removed as much as possible.

Though nearly all students finish their programme with a study delay, only a few identify programme-related factors as the cause. From the evaluations it can be concluded that students spend on average about 35 hours a week, which is about 85% of the time anticipated for the study load.

Students sometimes report a certain imbalance in the study load. Often this is caused by the fact that they try to combine subjects from different years in their programme.

The score for this Facet is ‘Sufficient’.

**F8: Intake**
The structure and contents of the programme are in line with the qualifications of the students that embark on the degree course:
- Bachelor’s degree at a University (WO): VWO (pre-university education), propaedeutic certificate from a University of Professional Education (HBO) or similar qualifications, as demonstrated in the admission process.
- Master’s degree at a University (WO): bachelor’s degree and possibly selection (on contents of the subject).

The intake in the IDE Master’s programme consists almost exclusively of students who recently completed their IDE Bachelor’s programme at UT. However, IDE BSc graduates from TU Delft and TU/e and from academic programmes recognised by IDE UT as equivalent have unconditional access.

BSc graduates in IDE and allied programmes of Dutch polytechnics and other students who have been admitted to the pre-Master’s programme and have successfully completed their pre-Master’s programme are admitted to the IDE Master’s programme as well. IDE BSc graduates from outside the Netherlands are admitted on the basis of the outcome of a selection and programme review process.

Information about the Master’s programme is available on the web, and information sessions are organised twice a year. In their second year UT IDE Bachelor’s students are informed about the choices to make, for example for the minor. In that information session a short overview of the Master’s programme is included.

In their third year at UT, IDE Bachelor’s students have the opportunity to participate in the information sessions about the Master’s programme.

The score for this Facet is ‘Sufficient’.

**F9: Duration**
The degree course complies with formal requirements regarding the size of the curriculum:
- Bachelor of a University (WO): 180 credits as a rule.
- Master of a University (WO): a minimum of 60 credits, dependent on the relevant degree course.

The Master’s curriculum has a study load of 120 EC and a nominal study duration of two years.
The curriculum size of the Master’s programme is in accordance with the European Credit Transfer System (ECTS).

The score for this Facet is ‘Sufficient’.

F10: Coordination of structure and contents of the degree course

- The didactic concepts are in line with the aims and objectives.
- The teaching methods correspond to the didactic concept.

The PLE concept of the Bachelor’s programme is not continued in the Master’s programme. The Master’s programme uses an educationally flexible concept, allowing the student to obtain the required competencies in a more individual way. The Master’s students interviewed confirmed that they do not suffer from this break in style since they obtained the necessary skills during their Bachelor’s study to continue working in self-propelled groups in the Master’s programme. MSc students study the theory without supporting tutorials and apply the theory often in assignments which have individual consultation and feedback. Most of the assignments of the Master’s programme are to be done individually. Some of the students interviewed expressed that they missed being part of a group.

The graduation project, a dominant part of the Master’s programme (45 EC), is often embedded in a broader research or design study with a researcher or experienced engineer as supervisor.

The score for this Facet is ‘Sufficient’.

F11: Assessments and examinations

The system of assessments and examinations provides an effective indication whether the students have reached the learning targets of the course programme or its components.

The Faculty’s policy regarding the assessment of student performance and the examination and assessment procedures are defined and documented in the Education and Examination Regulations (EER).

Most of the theory courses are assessed using written examinations. Oral examinations are used for the courses with a substantial skills and/or integration component.

The graduation project is concluded by submitting the Master’s thesis, presenting the results for an academic audience, and defending the results in a closed session with the Assessment Committee (AC), appointed by the Examination Committee. Finally, the Master’s student presents the work done to a public audience at graduation. The AC is chaired by the chair holder, while the supervisor and an independent staff member are members of the committee. The in-company supervisor, if present, has an advisory position.

The assessment criteria for examinations are well defined and documented. The regulations are transparent and accepted by the students, who are familiar with them.
Occasionally, a student or student group submits an appeal to the EC in relation to an assessment. The appeal is handled in accordance with the EER procedures.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 2 is ‘Sufficient’.

1.4.3. Deployment of staff (Topic 3)

<table>
<thead>
<tr>
<th>F12: Requirements for University</th>
</tr>
</thead>
<tbody>
<tr>
<td>The degree course meets the following criteria for the deployment of staff for a degree course at a University (WO):</td>
</tr>
<tr>
<td>Teaching is largely provided by researchers who contribute to the development of the subject area.</td>
</tr>
</tbody>
</table>

Nearly all scientific staff are involved in the various research programmes of the university research institutes such as IMPACT, CTIT, BMTI and IGS. The target for scientific staff is a 40/40/20% distribution between education, research and overhead. An internal comparison by UT management revealed that the overhead of the Faculty is the lowest in the university.

The link with the professional practice is made in projects and specialised courses by guest lecturers from design firms and industrial companies.

The number of scientific publications, and thus the evidence of having created new knowledge, is relatively low. This is probably caused by the high teaching load of the academic staff as discussed under Facet 13 below.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F13: Quantity of staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>The staff levels are sufficient to ensure that the course is provided to the required standards.</td>
</tr>
</tbody>
</table>

Currently, 9.99 fte of IDE staff is available for IDE education versus a total of 23.60 fte. When the staff from other faculties teaching in the IDE programmes is included as well, 11.98 fte are available for education.

Currently, the student to staff ratio for IDE amounts to 29.2, when the external fte from other faculties are counted.

The staff is experiencing an increasing demand for education with growing student numbers. When asked, the BSc teachers confirmed that they would choose to invest in more staff members to enable more research activities whilst maintaining the level of educational activities. The Master’s programme teachers, in turn, would mainly choose to invest in facilities that support the research.

Many staff members admit that they spend more time on their educational duties than the normative time. In other words, the relatively high teaching load is sustained by a high commitment. The Faculty has recognised this problem in its 2007 budget proposal in which 4.3 fte additional staff are envisaged.
Generally speaking, the demands and pressure have increased to a level at which the staff are fully occupied. Without re-appraising priorities, further teaching demands cannot be accommodated.

The score for this Facet is ‘Sufficient’.

**F14: Quality of staff**

The staff is sufficiently qualified to ensure that the aims regards contents, didactics and organization of the course programme are achieved.

The teachers are well motivated and prepared for their teaching duties, with respect to both their field of expertise and the required teaching skills.

The majority of the teaching staff has a PhD degree or is working on a PhD thesis.

The range of expertise available suffices for handling most of the content of the Master’s programme. The remaining content is covered by specialist courses from design firms and industrial companies.

Didactic skills are part of the assessment of new staff and of the annual ‘functioning evaluation and performance review’ of tenured staff.

Since 1994 it has been the University’s policy to enter newly appointed staff with teaching duties in educational upgrading programmes. In general, new assistant and associate professors participate in the Didactic Training Course for University Personnel (DUIT); the course has a workload of 250 hours. Staff who successfully complete the DUIT programme receive the ‘basic qualification for education’. Six universities in the Netherlands mutually recognize each other’s basic qualifications in this respect. For full professors a short refresher course exists.

The score for this Facet is ‘Good’.

**The overall score for Topic 3 is ‘Sufficient’**.

### 1.4.4. Facilities and provisions (Topic 4)

**F15: Material facilities**

The accommodation and material facilities are sufficient to implement the programme.

The rooms and facilities for Master’s students are adequate for the execution of the programme. Master’s students do not have their ‘own workplace’ but use a form of ‘hot-desking’ in which they can occupy any available workplace. Some of the students interviewed expressed the need for more ‘private’ space, for example to properly store prototypes.

Special note is made of the Virtual Reality Room on the premises of the Faculty that offers ideal conditions, systems and tools for IDE research projects and related Master’s project activities.
MSc students can make use of the workstations in the various departments, in addition to any laptop they may possess. Wireless access to the Internet and servers is available everywhere in the Faculty building and on the campus.

Through the portal ‘My Campus’, students have access to all electronic services of the University and of the Faculty as well as to course information, the system to register for exams or to retrieve exam results, and the electronic learning environment TeleTOP. Through TeleTOP, teachers inform students about the details of the schedule, course-supporting material like hand-outs, sheets and feedback on exercises.

The students consider the ICT facilities adequate.

The score for this Facet is ‘Sufficient’.

F16: Student support and guidance

- The student support and guidance, as well as the information given to students are adequate for the purpose of students’ progress.
- The student support and guidance, as well as the information given to students meet the requirements of the students.

Growing student numbers cause some concern about the sustainability of the counselling system in the future. Counselling is supported by a system for student progress. Because the software for the system is no longer up to date, this support is time-consuming and inadequate. The Faculty is developing a temporary support tool for counselling.

In the recent years, with many renovations and relocations in progress, the information provided to students was not always adequate and on time. Now the situation has stabilised and improved. Student members of the Education Committee and the Evaluation Committee confirmed that the information is adequate, meets the requirements of the students and is on the Internet.

The students are formally informed about their study progress twice a year. Through the portal ‘My Campus’, students have access to the system to register for exams and to retrieve exam results.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 4 is ‘Sufficient’.

1.4.5. Internal quality assurance (Topic 5)

F17: Evaluation of results
The degree course is subject to a periodic review, which is partly based on verifiable targets.

The Internal Quality Assurance System applied for the IDE programme is a system of the Faculty Engineering Technology (CTW), and thus the same as that used for the Civil Engineering and Mechanical Engineering programmes offered by the Faculty. The IQA system offers a
structured approach for the monitoring and review of Outcome, Product, Output and Process of the IDE Bachelor’s and Master’s programmes. Reference groups are used to ensure meaningful and comparable data over the years.

Because the Master’s programme started in the academic year 2004/2005, some elements of the IQA system have been implemented only recently. Both the Bachelor’s and the Master’s programmes are evaluated systematically. Each course and the period (trimester) are subject to evaluation. Courses are evaluated once every 3 years at least. The trimester (period) evaluation consists of a summary of the course evaluations and specific evaluation subjects. It is noted that the new courses are not evaluated in such a systematic way from their outset. In the first years the emphasis is on monitoring and direct improvement of the education process (feed forward). The annual evaluation has not yet been carried out. Such an evaluation will focus on the reconciliation of course evaluations and result (output) figures.

The further implementation of the IQA system at the Master’s programme level will take place as the programme consolidates and results of the WO-monitor (review) become available.

A reflective self-evaluation report, presenting a clear summary of the strengths, weaknesses, dilemmas and actions for each topic of the assessment protocol, is one of the products of the IQA system.

Criteria have been defined for the IDE BSc and MSc graduates in terms of the levels they should have achieved for each of the seven competency areas as a result of the education process.

Targets have been defined for the quantitative results of the Bachelor’s and the Master’s education processes.

When in the future the Master’s evaluation is executed in full and its effectiveness is proven, a higher score than Sufficient could well be expected.

The score for this Facet is ‘Sufficient’.

F18: Measures to effect improvement
The results of this evaluation form the basis for measures that can be demonstrated to improve the course and that will contribute to reaching the targets.

Where evaluations show results below the targets, follow-up procedures are applied. The initiative for follow-up rests with the DoE. The effects of the measures are reviewed again by the Evaluation Committee and monitored by the Education Committee. For example, ‘ Unsatisfactory’ course evaluation outcomes are fed back to the teacher(s) concerned and evaluated again the next year.

The score for this Facet is ‘Sufficient’.

F19: Involvement of staff, students, alumni and the professional field
Staff, students, alumni and the professional field in which graduates of the course are to be employed are actively involved in the internal quality assurance.
Teaching staff and students are actively involved in all phases of the quality assurance process. The Disciplinary Council (education staff) and the Education Committee approved the IQA planning, the evaluation methods and the targets set.

The external network is not yet systematically used for providing feedback on the learning objectives and the programme requirements.

The professional field will be involved through the WO-monitor (alumni) as soon as some fifty IDE MSc graduates have found employment in the market.

The score for this Facet is ‘Sufficient’.

**The overall score for Topic 5 is ‘Sufficient’**.

### 1.4.6. Results (Topic 6)

**F20: Level that has been achieved**

The final qualifications that have been achieved correspond to the targets set for the final qualifications in level, orientation and domain-specific requirements.

The Committee reviewed three Master’s theses as part of this evaluation. In all cases the scores given by the Committee were in line with the scores awarded by the Faculty. The use of the English language in the theses should be improved.

Because the Master’s programme was implemented for the first time in the academic year 2004/2005, only a few Master’s theses were available. However, the Committee expects, on the basis of the verification of the programme and of the theses reviewed, that the programme ensures achievement of the final qualifications.

The score for this Facet is ‘Sufficient’.

**F21: Success rates**

To measure the success rates, target figures have been set in comparison with relevant other degree courses. The success rates meet these targets.

The Master’s programme has explicit target figures with regard to student progression rates at the programme and course level. To produce consistently comparable output figures, the Faculty uses reference groups, on the basis of which the numerical results are obtained.

The pass rates for the Master’s courses meet the targets. At the time of the evaluation it was – and still is – premature to draw conclusions about the output and progression rates compared with the set targets because of the small number of students studying in the Master’s programme.

The score for this Facet is ‘Sufficient’.

**The overall score for Topic 6 is ‘Sufficient’**.
2. The Faculty of Industrial Design Engineering, TU Delft

2.1. Introduction of the Faculty

Industrial Design Engineering at TU Delft was the first – and still is the largest – academic programme in IDE in the Netherlands. More than 3200 MSc students have graduated since its start as an independent degree programme in 1969. The Bachelor-Master system was introduced in September 2002. The Faculty now offers the Bachelor’s programme ‘Industrial Design Engineering’ and three Master’s programmes in ‘Integrated Product Design’, ‘Design for Interaction’ and ‘Strategic Product Design’. The mix of technical and behavioural sciences and the human orientation put the IDE Faculty in a unique position within TU Delft.

2.2. General reflection of the Committee

The Committee is impressed by the commitment of the students, staff and management of the IDE Faculty of TU Delft. Through the SER report and during the visit – in interviews and tours/poster sessions – the Faculty appeared as a mature and well organised IDE institute for which the next step could be not only professional but also academic IDE world leadership. World-class academic leadership is the basis of world-class education.

The Committee appreciates the Faculty’s modest attitude in this respect and the fact that its position and reputation are not leveraged. The students interviewed were well informed and enthusiastic, and they confirmed that their input makes a difference.

Currently, the strong focus and orientation on teaching are not yet balanced by a similar focus and orientation on academic research, although a very interesting concept ‘towards a new research portfolio for IDE/TU Delft’ was presented, aiming at the development of the trans-disciplinary science of IDE in TU Delft through building its own body of knowledge. Once a better balance is achieved between teaching and research in the future, staff research output should increase and be fed back into education.

Both Internationalization and External Contact have prominent positions. An internationalization policy has been developed and implemented. Students from abroad not only have different educational backgrounds and face cultural differences, they also have to adopt to a new didactical approach. The education of foreign students in general and the balance between project/group work and individual development in particular require careful attention to ensure that once accepted by the Faculty, the foreign students can complete their Master’s programme within two years.

The Faculty is planning to introduce a new Bachelor’s programme in one ‘big bang’ at the start of the academic year 2007/2008. One improvement it involves would be to achieve a higher level of integration of the IDE-disciplines and engineering sciences in the design as well as the possibility to offer a greater challenge to talented students.

It is the Committee’s opinion that high expectations, good spirits and a positive mood alone are not a guarantee for a successful transition. Such a transition needs careful change management.

The implementation by the Executive Board (in 2010) of a clear separation (‘hard cut’) between the entrance to the Master’s programme and the Bachelor’s graduation will bring along a dou-
ble challenge: 1) to prevent further study delay and 2) to stop BSc graduates dropping out before moving to the Master’s programme, for example because they accept a job while waiting to complete their Bachelor’s programme. On the other hand, it will create equal conditions in comparison with students coming from other Dutch and foreign universities and enable and encourage students to consider mobility after the Bachelor’s phase.

2.3. The assessment Protocol TU Delft BSc IDE

2.3.1. Objectives of the degree courses (Topic 1)

<table>
<thead>
<tr>
<th>F1: Domain-specific requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications of the degree course correspond to the requirements made to a degree course in the relevant domain (field of study/discipline and/or professional practice) by colleagues in the Netherlands and abroad and the professional practice.</td>
</tr>
</tbody>
</table>

The Delft Industrial Design Engineering degree programme is the oldest of its kind in the field of industrial design engineering, and has existed for more than 35 years. In 1969, an independent ‘Technical and Industrial Design’ course started and carried its own engineering qualification. In 1981 the engineering certificate and the bridging department were renamed ‘Industrial Design Engineering’, leading to the Faculty of Industrial Design Engineering of TU Delft in 1986. In 1997 the Faculty of Industrial Design Engineering and the Faculty of Mechanical Engineering and Marine Technology merged to form the Faculty of Design, Engineering and Production. The merger was not to the liking of many in the Faculty and led to an independent faculty of Industrial Design Engineering (IDE) in 2004, teaching and conducting research on industrial design engineering. Several international academic universities have used the TU Delft IDE degree programme as a model for the development of their own programme.

The field of Industrial Design Engineering is currently evolving from a set of mono-disciplinary sciences to a trans-disciplinary science, exceeding the level of inter-disciplinarity. The mission the Faculty of Industrial Design Engineering has chosen reads: “to contribute to the knowledge, skills, methods and professional attitudes in the field of integrated product development”. The Faculty aims to accomplish this mission through: “education and research at an internationally recognised scientific level”. The concern of the Faculty is: “to study, innovate and improve the development of durable products and their related services for people, on the basis of the balanced interests of users, industry, society and the environment”.

The objective of the IDE BSc programme is: “to provide students with a satisfactory preliminary education and to instil in them an aptitude for the field, culminating in the degree of BSc in Industrial Design Engineering”.

The booklet *Criteria for Academic Bachelor’s and Master’s Curricula* of the Delft University of Technology, Eindhoven University of Technology and University of Twente (3TU) was used in formulating the final qualifications or achievement levels of the Bachelor’s programme.

The programmes of Industrial Design Engineering of the 3TU have laid down the competencies and labour market positions of IDE graduates and the distinction between Bachelor’s and Master’s level in a common domain-specific reference frame (DSRK).
The IDE Faculty TU Delft (TU Delft) decided in 2005 to perform an international benchmark survey of their IDE Bachelor’s and Master’s programmes. The benchmark survey revealed that only a few institutes have seriously developed an IDE Master’s programme. The conclusion of the survey was that the achievement levels of the TU Delft IDE Bachelor’s and Master’s programmes correspond with the requirements made of similar degree courses in the relevant domain by colleagues in the Netherlands and abroad. Moreover, the TU Delft IDE Bachelor’s programme stand out with respect to: 1) design methodology, 2) the emphasis on sustainability, and 3) the balance of form giving and design engineering. The Faculty’s authority in the international field in this respect was also apparent at the second International Engineering and Product Design Education Conference (IEPDE) held in September 2004 in the Netherlands.

The score for this Facet is ‘Good’.

<table>
<thead>
<tr>
<th>F2: Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications of the degree course correspond to general, internationally accepted descriptions of the qualifications of a Bachelor or a Master.</td>
</tr>
</tbody>
</table>

The achievement levels of the IDE Bachelor’s programme of the Delft University of Technology (TU Delft) have been defined in line with the booklet *Criteria for Academic Bachelor’s and Master’s Curricula*. These criteria are formally accepted by the NVAO as a more expanded and relevant statement of the Dublin Descriptors, which must be respected as required by the QANU protocol. By having developed and implemented these criteria, the three Dutch universities of technology stand out positively from other universities in the Netherlands.

The criteria describe in detail the distinction in level between academic Bachelor’s and Master’s degrees, and also the range of intellectual attributes and understanding of contexts that a trained engineer may require, depending on career direction. Therefore, these criteria are more suitable for a specific qualitative examination of the Bachelor’s and Master’s programmes concerned than the Dublin Descriptors.

As the formulation of the IDE Bachelor’s programme achievement levels is largely based on the *Criteria for Academic Bachelor’s and Master’s Curricula*, compliance with the Dublin Descriptors is assured.

Based on the analysis performed by the Faculty and the verification carried out by the Committee, it can be concluded that the final qualifications of the degree courses meet the requirements laid down in the Dublin Descriptors.

The score for this Facet is ‘Good’.
**F3: Orientation**
The final qualifications of the degree course correspond to the following descriptions of a Bachelor and a Master at universities:

- The final qualifications are based on requirements made by the academic discipline, the international academic practice and, if applicable to the course, the relevant practice in the prospective professional field.
- A University (WO) bachelor possesses the qualifications that allow access to a minimum of one further University (WO) degree course at master's level as well as the option to enter the labour market.
- A University (WO) master possesses the qualifications to conduct independent academic research or to solve multidisciplinary and interdisciplinary questions in a professional practice for which a University (WO) degree is required or useful.

The Bachelor’s achievement levels (competencies) match the requirements of the national academic discipline, the international academic practice and the prospective professional field as described under Facets 1 and 2 above.

The Bachelor’s degree gives unconditional access to the appropriate Master’s programmes of the three technical universities (3TU) in the Netherlands. Moreover, Bachelor’s graduates have access to several other engineering programmes for which a specific minor is sometimes required. In total, IDE Bachelor’s graduates can be admitted to some 12 Master’s engineering programmes in the Netherlands. The admission criteria are regulated in a 3TU admission matrix.

After consultation with the professional practice, represented by the Educational Advisory Committee (EAC), the Faculty has chosen to align the accents of the IDE Bachelor’s programme towards a preliminary education rather than to a programme preparing for a career in a professional environment. The EAC prefers an educational development in depth to one in breadth.

The score for this Facet is ‘Sufficient’.

**The overall score for Topic 1 is ‘Sufficient’**.

### 2.3.2. Programme (Topic 2)

**F4: Requirements for university degree courses**
The programme meets the following criteria applicable to a degree programme at a University (WO):

- The students acquire knowledge on the interface between teaching and academic research within the relevant disciplines;
- The programme follows the developments in the relevant academic discipline(s), as it is demonstrated that it incorporates current academic theories;
- The programme ensures the development of skills in the field of academic research;
- For those courses for which this is applicable, the course programme has clear links with the current professional practice in the relevant professions.

Within the IDE Bachelor’s programme, the first year offers a broad orientation on the industrial design engineering specialisation and sub-sectors. The relationship between education and research is addressed in the second and third years, where the students learn that good design and research go hand-in-hand. In this context the Committee notes that although the programme is perceived as a ‘preliminary education’ in which different kinds of skills are to be developed, the emphasis on research could be enforced (research in this context is defined as “the creation of knowledge, adding to the body of knowledge of the IDE discipline”).
The five projects of the Bachelor’s programme on learning to design form the core of the curriculum. All these projects devote attention to design methodology and techniques. The complexity of the design projects increases as the curriculum progresses. The projects are representative of assignments students may face later in the professional practice. The objective of the projects is to apply the theory learned and to integrate it into a realistic, design-related task. A design project is therefore preceded and/or accompanied by courses offering knowledge relevant to IDE.

The Educational Advisory Committee is systematically consulted for feedback on the learning objectives and programme requirements.

Guest lecturers and part-time lecturers liaised with design firms or industrial companies give students an opportunity to form a view of their future occupational field.

The score for this Facet is ‘Sufficient’.

F5: Relationship between aims and objectives and contents of the programme

- The course contents adequately reflect the final qualifications, both with respect to the level and orientation, and with respect to domain-specific requirements.
- The final qualifications have been translated adequately into learning targets for the programme or its components.
- The contents of the programme offer students the opportunity to obtain the final qualifications that have been formulated.

The objective of the IDE BSc programme is: “to provide students with a satisfactory preliminary education and to instil in them an aptitude for the field, culminating in the degree of BSc in Industrial Design Engineering”. The motto of the IDE Faculty is “Creating successful products people love to use”.

Hence, the Faculty’s task: “to study, innovate and improve the development of durable products and their related services for people, on the basis of the balanced interests of users, society and the environment”. The Committee observed that, as a consequence, the programme educates the student in all relevant fields of industrial design engineering: Design, Design Engineering, Innovation, Management, Ergonomics and Formgiving. A strong relationship between the objectives and the contents of the education programme was also observed by the Committee.

The objective has been translated into achievement levels (or final qualifications) for the degree programme. These achievement levels were used as input in shaping the curriculum. The programme’s underlying theme is the five design projects. The courses are programmed alongside the design projects. The IDE BSc programme has no electives.

All first-, second- and third-year courses and projects have defined learning goals which are related back to the achievement levels of the IDE Bachelor’s programme. It is the Committee’s opinion that the contents of the courses and projects are adequate to achieve the defined objectives.

By mapping the courses and projects against the competency levels to be achieved, the Faculty has demonstrated that the final qualifications are achieved upon successful completion of the IDE Bachelor’s programme.
There were mixed opinions about the introduction of a minor. Some faculty members expressed concern about the coherence of the programme when one semester is used for topics which are not fully in agreement with the programme objectives. Others expressed positive views on the fact that the students can broaden their views by selecting courses from other departments, go international, etc.

The score for this Facet is ‘Good’.

<table>
<thead>
<tr>
<th>F6: Coherence of the programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students follow a programme of study that is coherent in its contents.</td>
</tr>
</tbody>
</table>

Coherence of the IDE BSc programme is achieved in three ways:

- the learning lines: Design, Design Engineering, Management and Innovation, Ergonomics and Formgiving;
- the design projects, the underlying theme of the programme;
- the clustering of sub-sectors, for example, around a consumer product or around ‘Learning to look at form’.

Evaluation of the courses shows that students generally approve the match between the courses, the projects and their associated prerequisites. An exception is formed by the mathematics courses. The introduction of the new IDE BSc programme has been taken as an opportunity to find a solution: there will no longer be separate Mathematics and Mechanics courses, but Maths and Mechanics will be integrated in the technical design-oriented thematic courses. The Committee is very interested in the teaching results of these thematic courses. There is a risk that insufficient knowledge and skills are acquired for a career as an academic Design Engineer.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F7: Study load</th>
</tr>
</thead>
<tbody>
<tr>
<td>The programme can be successfully completed within the set time, as certain programme-related factors that may be an impediment to study progress are removed as much as possible.</td>
</tr>
</tbody>
</table>

Students generally experience the IDE BSc programme as demanding. One reason is that the programme is packed with practical courses and assignments. A second reason is that students tend to spend too much time on the study element of designing. Despite trimming the scope of the design projects, students spend more time than foreseen by the Faculty in the planned study load. The Faculty reactively checks the study load distribution in two ways, i.e through course evaluations and time-keeping surveys, both part of its Internal Quality Assurance (IQA) system. Moreover, course evaluations show that students in general find the actual study load consistent with the planned study load.

The third reason is the breadth of the programme, demanding the development of skills of different kinds, and students are by nature not equally good in all disciplines.

The courses that consistently formed an obstacle in the IDE BSc programme are the Mechan-
ics ones. Many actions have been taken to improve this situation, for example, harmonization with the needs of the IDE students, the introduction of a computer-supported self-study system and improved course material. A summer class for the third-year Dynamics course resulted in a more than satisfactory success rate. Mechanics course results in general have improved but are still unsatisfactory. Further improvements are expected from the integrated thematic courses of the new IDE BSc programme to be implemented in the academic year 2007/2008.

Currently, only 25% of the students completes the Bachelor’s programme within 6 years. It should be noted that such results of teaching are related to the choice of individual students rather than to programme-related factors. A longer than nominal study time seems easily accepted by the students. It is the Committee’s opinion that a clear consensus about study duration should be developed among all stakeholders.

Some of the staff indicated that they would like to offer more challenge in the programme for talented students.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F8: Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>The structure and contents of the programme are in line with the qualifications of the students that embark on the degree course:</td>
</tr>
<tr>
<td>• Bachelor’s degree at a University (WO): VWO (pre-university education), propaedeutic certificate from a University of Professional Education (HBO) or similar qualifications, as demonstrated in the admission process.</td>
</tr>
<tr>
<td>• Master’s degree at a University (WO): bachelor’s degree and possibly selection (on contents of the subject).</td>
</tr>
</tbody>
</table>

The intake in the Bachelor’s programme consists almost exclusively of students who recently completed their secondary school education, with Maths and Physics as majors at the highest level in their profiles, i.e. with a pre-university (vwo) certificate ‘Nature and Technology’ or ‘Nature and Health’. Any of the latter students without optional Maths B2 are deemed to be deficient in their knowledge of mathematics. These students are advised to pass the first-year courses Analysis 1 and 2.

Some 20% of the Bachelor’s intake are transfer students coming from another university programme or with a first-year certificate from a related university of professional education (hbo) degree programme. The Central Student Administration assesses such new students for adequate starting qualifications, while the Executive Board carries out the assessment for similar students coming from abroad.

Information about the TU Delft IDE Bachelor’s programme is available in brochures and on the web. To become familiar with the BSc programme, potential students can attend the spring and autumn information days. Further ‘taster days’ and ‘trial study’ as well as one-to-one talks with a study advisor are offered to inform potential students about the programme and career prospects.

The score for this Facet is ‘Sufficient’.
F9: Duration
The degree course complies with formal requirements regarding the size of the curriculum:
• Bachelor of a University (WO): 180 credits as a rule.
• Master of a University (WO): a minimum of 60 credits, dependent on the relevant degree course.

The Bachelor's curriculum has a study load of 180 European Credits (one EC nominally corresponds to 28 hours of study) and a nominal study duration of three years.

The curriculum size of the Bachelor's programme is in accordance with the European Credit Transfer System (ECTS).

The score for this Facet is ‘Sufficient’.

F10: Coordination of structure and contents of the degree course
• The didactic concepts are in line with the aims and objectives.
• The teaching methods correspond to the didactic concept.

Teaching of knowledge and insight runs largely synchronous with their application. The application, described as ‘Learning to design’, is the guiding principle of the IDE Bachelor’s programme.

The Faculty adopted a project-based form of design education as one of the key aspects of their didactic concept. In that concept, the design projects form an underlying theme throughout the curriculum. About one-third of the study load is devoted to practicals, assignments and projects, some 20% is devoted to lectures and constructions and 45% to self-study. The proportion of project education increases in the course of the programme, while the proportion of lectures and constructions decreases. The latter fits with another aspect of the didactic concept whereby the ‘more student-centred teaching formats’ increase as the programme progresses. A third key aspect of the didactic concept is the clustering of the components of a discipline within one course.

The ideal situation in which knowledge is available ‘real time’ from the disciplines before being integrated in the design process is a target, but experience has shown that this degree of coordination is hard to achieve. The planned integration within the IDE Bachelor’s programme has not succeeded in all aspects yet, and a more competency-oriented didactic concept has been adopted for the development of the new IDE Bachelor’s programme that will be implemented starting from the academic year 2007/2008.

The score for this Facet is ‘Sufficient’.

F11: Assessments and examinations
The system of assessments and examinations provides an effective indication whether the students have reached the learning targets of the course programme or its components.

The IDE Faculty uses several examination and assessment methods in line with the objectives of a course. The examination and assessment methods for each course, assignment and project are defined and documented in the Study Guide. In general, knowledge-based objectives are
tested in a written examination. Courses with an emphasis on skills utilize practical training results or the presentation of a student portfolio as their examination method. The portfolio-related examinations generally involve a discussion between the assessor and the student in which the marks awarded are substantiated. The assessment of group projects and group assignments is based on the results of the group and on an individual assessment.

The examination regulations are formulated by the Board of Examiners (BoE). The opinion of the Teaching Committee and of the Faculty Student Council are solicited, after which the examination regulations are adopted by the Dean of the Faculty.

The regulations include a clause on the right of students to inspect their examination results. This right is exercised and leads sporadically to a formal protest (less than once a year for the Bachelor’s and Master’s programmes together).

Some Bachelor’s students remarked that the assessment criteria are not always clear, and that assessment and examination results are not always published on Blackboard.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 2 is ‘Sufficient’.

2.3.3. Deployment of staff (Topic 3)

The degree course meets the following criteria for the deployment of staff for a degree course at a University (WO):

- Teaching is largely provided by researchers who contribute to the development of the subject area.

The teaching in the IDE Faculty is provided by academic staff (full, associate and assistant professors of whom 60% have a PhD) and lecturers (usually employed part-time in the faculty alongside employment in the professional practice). The policy of the IDE Faculty is that as many staff members as possible should combine teaching and research. The proportion doing so was 65% in September 2006. This approach ensures that the teaching is nourished by researchers. The quality of the Faculty’s research was recognised by the last research visit and by the annual Research Advisory Board meeting.

From the first year on students come into contact with professors and PhD staff with lecturing duties.

The recruitment of part-time staff is a deliberate strategy to involve practising professionals and leading designers in the IDE Bachelor’s programme.

The score for this Facet is ‘Sufficient’.
F13: Quantity of staff
The staff levels are sufficient to ensure that the course is provided to the required standards.

The figures presented in this section apply to the combined staff of the Bachelor's and Master's programmes. Currently, a total of 63.7 fte of IDE staff is available for education, from a total of 154.74 fte. When the staff from other faculties teaching in the IDE programmes is counted as well, 68 fte are available for education. These numbers illustrate the target for academic staff that the time distribution for education, research and overhead approximately equals 40/40/20%.

Currently, the student to staff ratio for IDE amounts to 25.5 (average 27 over the last three years) including the external fte from the other faculties.

The average student to staff ratio of 27 is slightly lower than that of the IDE Faculty of UT (29.9) and favourable when compared with e.g. Erasmus University and Tilburg University.

Some of the academic IDE staff interviewed mentioned the risk in terms of overloading.

The score for this Facet is ‘Sufficient’.

F14: Quality of staff
The staff is sufficiently qualified to ensure that the aims regards contents, didactics and organization of the course programme are achieved.

Around 60% of the teaching staff (full, associate and assistant professors) have a PhD. The composition of the lecturing team is broad, and the range of expertise available suffices for handling the contents of the Bachelor's programme. The Committee feels that the research orientation of the Bachelor’s teachers should be further strengthened.

The IDE Faculty applies a procedure according to which educational performance is part of the annual staff performance review (R&O cycle). The intention is to give the evaluation results a formal place in the R&O cycle. A university job classification exercise was started in 2004 in support of the procedure.

Newly appointed teaching staff and those already appointed in 2003, 2004 and 2005 have to attend the TU Delft ‘Basic Teaching Qualification’ course. A variety of circumstances, the reorganization of the Education and Student Affairs Department (ESAD) and more particularly within the Personnel Department, have limited the progress of this plan. A project leader to drive these activities was appointed in May 2006, and agreements have been made for six persons a year (two from each department of the Faculty) to attend the course.

Although the faculty is aiming at an increase in the number of teaching staff, a delay in the didactic training of existing teachers was observed.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 3 is ‘Sufficient’.
2.3.4. Facilities and provisions (Topic 4)

<table>
<thead>
<tr>
<th>F15: Material facilities</th>
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<tbody>
<tr>
<td>The accommodation and material facilities are sufficient to implement the programme.</td>
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</table>

The IDE Faculty now resides in a modern building with facilities very well tailored to a design-oriented degree programme. The building contains student-oriented facilities like design studios, lecture theatres, computer rooms, freehand drawing rooms, the Model Making and Machine Shop, the Laboratory for Product Analysis, research and test rooms and the Industrial Design Engineering Library.

Through Blackboard, the TU Delft standard electronic learning environment, the students have access to 90% of the course-related information. The electronic learning environment also provides exercises and examinations and supports communication between lecturers and students.

The score for this Facet is ‘Good’.

<table>
<thead>
<tr>
<th>F16: Student support and guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student support and guidance, as well as the information given to students are adequate for the purpose of students’ progress.</td>
</tr>
<tr>
<td>The student support and guidance, as well as the information given to students meet the requirements of the students.</td>
</tr>
</tbody>
</table>

The Bachelor’s student support and guidance system is elaborate.

Systematic counselling has been implemented for all first-year students once a year. In the case of unsatisfactory results, the student is invited a second time. Potential drop-outs are offered specific counselling. At the end of the year, the students receive a recommendation about whether or not to continue their study programme. Some of the students interviewed expressed the wish to receive such a recommendation earlier. During the first-, second- and third-year, ad-hoc counselling is provided upon request. During the second year, students who failed the half-year Design Project 2 are invited for a discussion with the counsellor.

Each first-year student is paired up with a student-mentor. These senior students are ‘responsible’ for a group of ten students and play an important role in providing first-year students with relevant information. Student assistants organise the student mentor system and student mentor training. The mentor system also has an important social function.

Blackboard, the electronic learning environment, provides students with on-line access to their registered examination results and grading. The Service Point information desk provides students with information about enrolment, timetable changes, events, lectures, etc.

The students consider the support and guidance procedures and systems adequate.

The students interviewed mentioned the fact that the study advisors have a waiting list which causes several weeks of delay after a request for counselling is logged and the lack of a year-end study advice.
The score for this Facet is ‘Sufficient’.

The overall score for Topic 4 is ‘Sufficient’.

2.3.5. Internal quality assurance (Topic 5)

<table>
<thead>
<tr>
<th>F17: Evaluation of results</th>
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</table>
The degree course is subject to a periodic review, which is partly based on verifiable targets.

The Internal Quality Assurance System applied to the IDE programme is based on the concept of the TU Delft-wide developed quality assurance system. The system offers a definition of quality, i.e. the degree to which the objectives of the degree programme are realized, and the associated IDE Faculty quality standards. Furthermore, the system provides a set of quality monitoring instruments (for example, the SENSOR enquiries for course monitoring), a procedure for the follow-up of monitoring results and a description of relevant organizational responsibilities. The system is applied to both the IDE Bachelor’s and Master’s programmes.

Each course and the programme covering one semester are subject to evaluation. The semester evaluation is the highest evaluation level of the IDE IQA system. In addition, evaluations are carried out for the results of teaching, student time-keeping, facilities, complaint procedures and student exit interviews.

A professional self-assessment report, presenting an evaluation of and action plan for each facet and topic, is one of the products of the IQA system.

Some students complained that the feedback from SENSOR enquiries has been inadequate in specific cases, for example in the case of the course ‘Ergonomics’ and the course ‘Environmental Science and History’.

Criteria have been defined for the IDE Bachelor’s and Master’s graduates in terms of the final achievement levels of the degree. Targets have been defined for the quantitative results of the Bachelor’s and the Master’s education processes.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F18: Measures to effect improvement</th>
</tr>
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</table>
The results of this evaluation form the basis for measures that can be demonstrated to improve the course and that will contribute to reaching the targets.

The recommendations of the previous educational evaluation (VSNU report May 2002) have been followed up carefully. The Faculty has undertaken to resolve a sizable list of specific actions since the last visit, and a majority of the recommendations has been implemented. This resulted, for example, in the Faculty’s independence in 2004 and the introduction of a new Bachelor’s programme that will be implemented in the academic year 2007/2008. A more competency-oriented didactic concept has been adopted for the development of the new Bachelor’s programme. Recommendations resulting from evaluations of the existing Bachelor’s programme are also being incorporated in the new programme, for example the uneven study
load distribution in the semesters and the transformation of obstacle courses (Mathematics and Mechanics) into thematic courses integrated with industrial design engineering applications. The major-minor structure, not yet part of the existing programme, will also be implemented in the new programme. All BSc students will be transferred from the old to the new Bachelor’s programme at the same time.

The Educational Advisor discusses the outcomes of evaluations with the lecturer in question. A summary of the evaluation results, the person’s response and the agreed actions for improvement are documented and submitted to the Board of Education. Where evaluations show results below target, a follow-up survey is scheduled for the following year. The initiative for follow-up rests with the Educational Advisor, a delegated responsibility from the DoE. Examples of follow-up are obvious from the cases described above.

Some students indicated that the terms and conditions for the transfer to the new Bachelor’s programme were still unclear to them.

No planning was found for the changeover from the existing to the new Bachelor’s programme, and it is unclear where the role of change manager is placed in the Faculty organisation, thereby ensuring that the academic staff remains focussed on the content matter.

The score for this Facet is ‘Good’.

<table>
<thead>
<tr>
<th>F19: Involvement of staff, students, alumni and the professional field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff, students, alumni and the professional field in which graduates of the course are to be employed are actively involved in the internal quality assurance.</td>
</tr>
</tbody>
</table>

Teaching staff and students are actively involved in all phases of the quality assurance process. The full Board of Education approves the IQA activity plan developed by the Educational Advisor.

A strong network exists for student representation, consisting of the ID society, the OKIO, an active study association, and response groups. The self-evaluation report was communicated with a focus group and, at a later date, with the Faculty Council, the ID society and several other stakeholder groups.

The professional field is involved through the WO-monitor (alumni) and through the Educational Advisory Committee, which represents and arranges further systematic involvement of the professional field.

The score for this Facet is ‘Good’.

**The overall score for Topic 5 is ‘Sufficient’**.
2.3.6. Results (Topic 6)

F20: Level that has been achieved
The final qualifications that have been achieved correspond to the targets set for the final qualifications in level, orientation and domain-specific requirements.

The Committee reviewed four Bachelor’s theses as part of this evaluation. In all cases the scores awarded by the Committee were in line with the scores awarded by the Faculty. The Committee is aware of the fact that their review of some of the theses is only part of the full final assessment of the competencies achieved by a particular student. Based on the theses reviewed, the Committee is of the opinion that the Bachelor’s graduates have achieved the final qualifications. The use of the English language in the theses should be improved.

The score for this Facet is ‘Sufficient’.

F21: Success rates
To measure the success rates, target figures have been set in comparison with relevant other degree courses. The success rates meet these targets.

The Faculty has set explicit target figures with regard to student progression rates (credits achieved), propaedeutic and Bachelor’s pass rates. The targets were defined for the ‘joiners from pre-university education’ (vwo). The targets for propaedeutic and Bachelor’s pass rates were not met, despite a variety of measures taken to improve the pass rates. The propaedeutic pass rate within one year improved from some 10% to around 20%, compared with a target of 33%. The ultimate propaedeutic pass rate target of 67% is expected to be achieved for most intakes. The modest IDE target for the Bachelor’s pass rate after 3 years of 30%, compared with the 3TU target of 70% within 4 years, was not met. Only a very limited number of students (< 2%) completes the Bachelor’s programme in the nominal three-year period. So far, the Bachelor’s pass rate after five years is on the order of 10%. The question could be asked of whether the selective function of first year is adequate.

Plans to improve the Bachelor’s pass rates further have been devised, especially in the context of the new Bachelor’s programme. Some examples of perceived actions are: the selection of another didactic concept in which more thematic courses, a more direct link with the professional practice, more choice for the students (motivation) and the new educational structure in which a maximum of two courses are taken in parallel, thereby avoiding fragmentation.

These Results of Teaching can to a large extent be explained by the fact that students do not follow the full programme load each year; mainly caused by personal choices and priorities in terms of, for example, taking a job or organising student associations and therefore spending fewer than the advised number of study hours per week. This remains an area of concern for the Faculty.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 6 is ‘Sufficient’.
2.4. The assessment Protocol TU Delft IDE MSc IPD

2.4.1. Objectives of the degree courses (Topic 1)

**F1: Domain-specific requirements**
The final qualifications of the degree course correspond to the requirements made to a degree course in the relevant domain (field of study/discipline and/or professional practice) by colleagues in the Netherlands and abroad and the professional practice.

The Delft Industrial Design Engineering degree programme is the oldest of its kind in the field of industrial design engineering and has existed for more than 35 years. In 1969, an independent ‘Technical and Industrial Design’ course started and carried its own engineering qualification. In 1981 the engineering certificate and the bridging department were renamed ‘Industrial Design Engineering’, leading to the Faculty of Industrial Design Engineering of TU Delft in 1986. In 1997 the Faculty of Industrial Design Engineering and the Faculty of Mechanical Engineering and Marine Technology merged to form the Faculty of Design, Engineering and Production. The merger was not to the liking of many in the Faculty and led to an independent faculty of Industrial Design Engineering (IDE) in 2004, teaching and conducting research on industrial design engineering. Several international academic universities have used the TU Delft IDE degree programme as a model for the development of their own programme.

The field of Industrial Design Engineering is currently evolving from a set of mono-disciplinary sciences to a trans-disciplinary science, exceeding the level of inter-disciplinarity.

The mission the Faculty of Industrial Design Engineering has chosen reads: “to contribute to the knowledge, skills, methods and professional attitudes in the field of integrated product development”. The Faculty aims to accomplish this mission through: “education and research at an internationally recognised scientific level”.

The concern of the Faculty is: “to study, innovate and improve the development of durable products and their related services for people, on the basis of the balanced interests of users, industry, society and the environment”.

In the academic year 2003/2004 the TU Delft IDE Faculty started three Master’s programmes: ‘Integrated Product Design’ (IPD), ‘Design for Interaction’ (DfI) and ‘Strategic Product design’ (SPD). The IPD Master’s programme can be considered as the continuation, at the Master’s level, of the broad IDE Bachelor’s programme.

IPD focuses on the designing of innovative products and product-service combinations for people, based on balancing the interests of users, industry and society. The subject of IPD encompasses nearly everything that is mass produced or in series to satisfy consumer demand. This profile has been translated into achievement levels (or final qualifications) for the degree programme. Use was made of the booklet *Criteria for Academic Bachelor’s and Master’s Curricula* which is written by the three technical universities of the Netherlands (3TU) describing the general achievement level specification for an academic engineer.

The programmes of Industrial Design Engineering of the 3TU have defined the competencies and labour market positions of IDE graduates and the distinction between Bachelor’s and Master’s level in a common domain-specific reference frame (DSRK).
The Faculty decided in 2005 to perform an international benchmark survey. It revealed that only a few institutes have seriously developed an IDE Master’s programme. To the extent that it was possible to compare programmes, it could be concluded that the achievement levels of the IPD Master’s programme corresponded with the requirements made of similar degree courses in the relevant domain by colleagues in the Netherlands and abroad. Moreover, the IPD Master’s programme stand out with respect to: 1) the substantial proportion of engineering education, 2) the - more than internationally usual - attention to design and research methodology, and 3) the relatively little attention devoted to business aspects. The Faculty’s authority in the international field in this respect was also apparent at the second International Engineering and Product Design Education Conference (IEPDE) held in September 2004 in the Netherlands.

The Educational Advisory Committee (EAC), representing the professional field, plays an important role in the external assessment of the achievement levels of the Master’s programme on the Faculty’s behalf.

The score for this Facet is ‘Good’.

| F2: Level |
The final qualifications of the degree course correspond to general, internationally accepted descriptions of the qualifications of a Bachelor or a Master.

The achievement levels of the IDE IPD Master’s programme of TU Delft have been defined in line with the booklet *Criteria for Academic Bachelor’s and Master’s Curricula*. These criteria are formally accepted by NVAO as a more expanded and relevant statement of the Dublin Descriptors, which must be respected as required by the QANU protocol. By having developed and implemented these criteria, the three Dutch universities of technology stand out positively from other universities in the Netherlands.

The criteria describe in detail the distinction in level between academic Bachelor’s and Master’s degrees, and also the range of intellectual attributes and understanding of contexts that a trained engineer may require, depending on career direction. Therefore, these criteria are more suitable for a specific qualitative examination of the Bachelor’s and Master’s programmes concerned than the Dublin Descriptors.

As the formulation of the IPD Master’s programme achievement levels is largely based on the *Criteria for Academic Bachelor’s and Master’s Curricula*, compliance with the Dublin Descriptors is assured.

Based on the analysis performed by the Faculty and the verification carried out by the Committee, it can be concluded that the final qualifications of the degree courses meet the requirements laid down in the Dublin Descriptors.

The score for this Facet is ‘Good’.
F3: Orientation
The final qualifications of the degree course correspond to the following descriptions of a Bachelor and a Master at universities:
- The final qualifications are based on requirements made by the academic discipline, the international academic practice and, if applicable to the course, the relevant practice in the prospective professional field.
- A University (WO) bachelor possesses the qualifications that allow access to a minimum of one further University (WO) degree course at master’s level as well as the option to enter the labour market.
- A University (WO) master possesses the qualifications to conduct independent academic research or to solve multidisciplinary and interdisciplinary questions in a professional practice for which a University (WO) degree is required or useful.

The IPD Master’s programme achievement levels (final qualifications) do match the requirements of the national academic discipline, the international academic practice and the prospective professional field as described under Facets 1 and 2 above.

The IPD Master’s graduate has ample opportunity to continue a PhD study. At the time of the evaluation, the IDE departments counted 58 PhD students, of whom 17 held an IDE Master’s degree from TU Delft. An increasing number of graduates opts for an academic career within the university or in a research organisation like TNO.

A recent alumni survey evidenced the high esteem for the qualities of graduates. The position on the labour market of the IPD Master’s graduates is good due to their capability to resolve multidisciplinary and interdisciplinary questions.

A strong orientation towards positions in industry was observed. The orientation on research should be treated as a point for attention.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 1 is ‘Sufficient’.

2.4.2. Programme (Topic 2)

F4: Requirements for university degree courses
The programme meets the following criteria applicable to a degree programme at a University (WO):
- The students acquire knowledge on the interface between teaching and academic research within the relevant disciplines;
- The programme follows the developments in the relevant academic discipline(s), as it is demonstrated that it incorporates current academic theories;
- The programme ensures the development of skills in the field of academic research;
- For those courses for which this is applicable, the course programme has clear links with the current professional practice in the relevant professions.

A uniform educational structure has been defined for the three IDE Master’s programmes. The structure consists of joint courses to be taken by all Master’s students, an integral design project (joint assignment) in which the students of the three Master’s programmes work jointly on a design task, courses specific to the Master’s programme, elective courses and the final project. The joint courses cover Design Theory and Methodology, Applied Research Methods and Techniques in Design, Professional Design Practice, and Preparation for Graduation.
The joint design assignment covers the entire design process in which the students solve a complex design problem for a client in the professional practice while focusing on specific elements of their track (IPD, DfI or SPD). Each of the Master's programmes has a package of specific courses that focus on the elements of the programme concerned. The courses are accompanied by specific projects, two for each programme, in which the students learn to apply the course material and place it in the appropriate context. The programme also includes electives (18 EC) enabling the students to deepen their understanding of particular aspects. The students complete the Master's programme with the final project (30 EC). It is traditional for the final project to be performed mainly with and for industry or other organisations outside the Faculty. However, in recent years, interest has been growing among Master's students for a research-oriented graduation project either within the Faculty or within the Delft Design Institute.

In relation to the subject of research, the Committee notes that ‘integration’ is an essential keyword in the IPD programme. The other side of the same coin is the risk of missing ‘depth’. It is the Committee's opinion that sufficient emphasis should be put on research (encouraging integration), i.e. on the development of the body of knowledge for IPD.

The Educational Advisory Committee is systematically consulted for feedback on the learning objectives and programme requirements. Guest lecturers, part-time lecturers liaised with design firms or industrial companies, and assignments that reflect the professional practice, and the joint ‘Professional Design Practice’ course give students an opportunity to form a view of their future occupational field.

The IDE Master's programmes have a clear format and framework of objectives in which ample attention is given to research and to the professional practice.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F5: Relationship between aims and objectives and contents of the programme</th>
</tr>
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<tbody>
<tr>
<td>• The course contents adequately reflect the final qualifications, both with respect to the level and orientation, and with respect to domain-specific requirements.</td>
</tr>
<tr>
<td>• The final qualifications have been translated adequately into learning targets for the programme or its components.</td>
</tr>
<tr>
<td>• The contents of the programme offer students the opportunity to obtain the final qualifications that have been formulated.</td>
</tr>
</tbody>
</table>

The objective of the IPD Master's programme is to focus on the designing of innovative products and product-service combinations for people, based on balancing the interests of users,
industry and society. The motto of the IDE Faculty is “Creating successful products people love to use”. The subject of IPD encompasses nearly everything that is mass produced or in series to satisfy consumer demand.

The curriculum gives students an opportunity to specialise in designing products that are related to the medical/rehabilitation field (the specialisation Medisign), mobility (the Automotive specialisation), or design research. The Committee observed a weaker focus than expected on the development of the body of knowledge for Product Design. There is a strong focus, however, on applied Product Design research.

Consequently, the programme’s key words cover all relevant fields of industrial design engineering like Design Theory and Methodology, Formgiving, Design Engineering, Life Cycle Engineering, Applied Research Methods and Techniques, Product Communication, Ergonomics, and Smart Systems and Technology.

The programme objective has been translated into achievement levels (or final qualifications) for the degree programme. These achievement levels were used as input in shaping the curriculum. All courses and projects have defined learning goals which are related back to the achievement levels of the IPD Master’s programme. It is the Committee’s opinion that the contents of courses and projects are adequate to achieve the defined course and project objectives. By mapping the learning goals of the courses and projects against the competencies to be achieved, the Faculty has demonstrated that the final qualifications are achieved upon successful completion of the IPD Master’s programme.

The programme’s structure and underlying theme of the design and graduation project are described under Facet 4 above.

The score for this Facet is ‘Sufficient’.

**F6: Coherence of the programme**
Students follow a programme of study that is coherent in its contents.

Coherence of the IPD Master’s programme is achieved in two ways:

- Coherence within the programme: the knowledge and skills acquired in the first Master’s year are applied in the Integral Design Project and in the Graduation Project, both in the second Master’s year.
- Coherence within a semester in the first year: the match between and relevance of the courses and projects within a semester, for example the Applied Ergonomics course and the Domestic Appliances Project where students perform part of the project under the supervision of the Applied Ergonomics course lecturers.

The course and semester evaluations show that students, in general, understand the relevance of the courses and the pre-requisites.

The score for this Facet is ‘Sufficient’.
F7: Study load
The programme can be successfully completed within the set time, as certain programme-related factors that may be an impediment to study progress are removed as much as possible.

An even distribution of the study load was the objective when the IDE Master’s curricula were developed. Hourly schedules facilitated the alignment and distribution of courses and projects on a weekly basis.

The pro-active annual check by the ESAD department of the hourly schedules as part of the study guide update was last done for the academic year 2005/2006 and was stopped with the introduction of the TU Delft-wide digital study prospectus. The Faculty will raise this issue in order to re-implement this check for the academic year 2007/2008.

The Faculty checks reactively the study load distribution in two ways, i.e through course evaluations and time-keeping surveys, both part of the Internal Quality Assurance (IQA) system of the Faculty.

Students generally experience the IDE Master’s programmes as demanding. The course evaluations show that students in general find the actual study load consistent with the planned study load.

IPD students, for example, identified the course ‘Product Communication and Presentation’ as an obstacle, although discussions with the students revealed that they tend to postpone the completion of the course.

The Faculty is aware of the student’s study load; other actions than course evaluations and time-keeping surveys are being performed, for example, at the level of compulsory and elective courses.

Despite all of the proactive and reactive measures in relation to the study load, the average time for students to complete the Bachelor’s and Master’s programmes exceeds the nominal time, which is in many cases due to the individual student’s personal choice.

The score for this Facet is ‘Sufficient’.

F8: Intake
The structure and contents of the programme are in line with the qualifications of the students that embark on the degree course:

- Bachelor’s degree at a University (WO): VWO (pre-university education), propaedeutic certificate from a University of Professional Education (HBO) or similar qualifications, as demonstrated in the admission process.
- Master’s degree at a University (WO): bachelor’s degree and possibly selection (on contents of the subject).

The majority of the intake in the TU Delft IDE Master’s programme IPD consists of students who recently completed their IDE Bachelor’s programme at TU Delft. Together with IDE Bachelor’s graduates from UT and TU/e, they have unconditional access. BSc university graduates from Dutch degree programmes other than IDE have various options: unconditional transfer, transfer with a number of requirements, transfer with a bridging course, or no transfer possible.
BSc graduates in IDE and allied programmes of Dutch polytechnics and other students who have been admitted to the bridging course and have successfully completed it are admitted to the IDE Master’s programme as well. In September 2007 a pilot started involving a TU Delft IDE bridging course in the minor profile of the university of professional education (hbo) degree programme.

IDE Bachelor’s graduates from outside the Netherlands are admitted on the basis of the outcome of a selection (including both grades and portfolio) and programme review process in which the most important criterion is that they must be able to obtain a degree within two years. The latter rules out full bridging courses, but a number of prescribed courses may be required.

The intake numbers of foreign students are increasing. Requests for admission to a Master’s programme continue to be assessed on an individual basis.

A dilemma still surrounds the requirement that once a Bachelor’s student from the TU Delft IDE Bachelor’s programme has obtained 150 EC (first and second year and half of the third year), he/she is admitted to IDE Master’s courses. The Executive Board is considering implementing by 2010 the so-called ‘hard cut’, meaning that a Bachelor’s student must have obtained all the credits of the Bachelor’s programme - 180 EC - before he/she is admitted to the Master’s programme. This is a normal requirement for transfer and foreign students. The implementation of a clear separation between the entrance to the Master’s programme and the Bachelor’s graduation will be accompanied by a double challenge: 1) to prevent further study delay and 2) to stop Bachelor’s graduates dropping out before moving to the Master’s programme, for example because they accepted a job while waiting to complete their Bachelor’s programme. On the other hand, it will create equal conditions in comparison with students coming from other Dutch and foreign universities and enable and encourage students to consider mobility after the Bachelor’s phase.

Information about the IPD Master’s programme is available in brochures and on the web. To become familiar with the Master’s programme, potential students can attend the spring and autumn information days. In addition, Master’s lunches for Bachelor’s transfer students and professional education students are held. Finally, one-to-one talks with a study advisor are offered to inform potential student about the programme and career prospects.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F9: Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>The degree course complies with formal requirements regarding the size of the curriculum:</td>
</tr>
<tr>
<td>• Bachelor of a University (WO): 180 credits as a rule.</td>
</tr>
<tr>
<td>• Master of a University (WO): a minimum of 60 credits, dependent on the relevant degree course.</td>
</tr>
</tbody>
</table>

The Master’s curriculum has a study load of 120 EC and a nominal study duration of two years.

The curriculum size of the Master’s programme is in accordance with the European Credit Transfer System (ECTS).

The score for this Facet is ‘Sufficient’.
The teaching of knowledge and insight runs largely synchronous with their application. This didactic concept was adopted for all three IDE Master’s programmes, consistent with the didactic concept of the Bachelor’s programme: “learning to apply and integrate knowledge and skills in various situations, a mix of teaching formats and continued development of independence and self-reliance on the part of the student”. In that concept the design projects are an underlying theme throughout the curriculum. The same project-based form of design education as for the Bachelor’s programme is used in the IDE Master’s programmes. An important factor in the formulation of the Master’s programmes has been the fact that various intake groups had to be considered.

About half of the study load of the first Master’s year is devoted to practicals, assignments and projects. Self-study and lectures form the other half. The second half of the second Master’s year is entirely devoted to the graduation project.

The semester evaluations have shown that the students appreciate in general the structure of the Master’s programme: courses and projects running in parallel and a mix of teaching formats in the first Master’s year.

The score for this Facet is ‘Sufficient’.

The IDE Faculty uses several examination and assessment methods in line with the objectives of the course concerned. The examination and assessment methods for each course, assignment and project are defined and documented in the Study Guide. In general, knowledge-based objectives are tested with a written examination. Courses with an emphasis on skills utilize practical training results or the presentation of a student portfolio as their examination method. The portfolio-related examinations generally involve a discussion between the assessor and the student in which the marks awarded are substantiated. The assessment of group projects and group assignments is based on the results of the group and on an individual assessment.

The examination regulations are formulated by the Board of Examiners (BoE). The opinion of the Teaching Committee and the Faculty Student Council are solicited, after which the examination regulations are adopted by the Dean of the Faculty.

The regulations include a clause on the right of students to inspect their examination results. This right is exercised and leads sporadically to a formal protest (less than once a year for the Bachelor’s and Master’s programmes together).

The score for this Facet is ‘Good’. 
The overall score for Topic 2 is ‘Sufficient’.

2.4.3. Deployment of staff (Topic 3)

<table>
<thead>
<tr>
<th>F12: Requirements for University</th>
</tr>
</thead>
<tbody>
<tr>
<td>The degree course meets the following criteria for the deployment of staff for a degree course at a University (WO):</td>
</tr>
<tr>
<td>Teaching is largely provided by researchers who contribute to the development of the subject area.</td>
</tr>
</tbody>
</table>

The teaching in the IDE Faculty is provided by academic staff (full, associate and assistant professors, of whom 60% have a PhD) and lecturers (usually employed part-time on the faculty alongside employment in the professional practice). The policy of the IDE Faculty is that as many staff members as possible should combine teaching and research. The proportion doing so was 65% in September 2006. This approach ensures that teaching is nourished by researchers. The quality of the Faculty’s research was recognised by the last review visit and by the annual Research Advisory Board meeting.

From the first year on, students come into contact with professors and PhD staff with lecturing duties.

The recruitment of part-time staff is a deliberate strategy to involve practising professionals and leading designers in the IDE Master’s programmes.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F13: Quantity of staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>The staff levels are sufficient to ensure that the course is provided to the required standards.</td>
</tr>
</tbody>
</table>

The figures presented in this section apply to the combined staff of the Bachelor’s and Master’s programmes. Currently, a total of 63.7 fte of IDE staff is available for education, from a total of 154.74 fte. When the staff from other faculties teaching in the IDE programmes is counted as well, 68 fte are available for education. These numbers illustrate the target for academic staff that the time distribution for education, research and overhead approximately equals 40/40/20%.

Currently, the student to staff ratio for IDE amounts to 25.5 (average 27 over the last three years) including the external fte from the other faculties.

The average student to staff ratio of 27 is slightly lower than that of the IDE Faculty of UT (29.9) and favourable when compared with e.g. Erasmus University and Tilburg University.

It was confirmed by the teachers that some vacancies were open too long.

The score for this Facet is ‘Sufficient’.
### F14: Quality of staff
The staff is sufficiently qualified to ensure that the aims regards contents, didactics and organization of the course programme are achieved.

Around 60% of the teaching staff (full, associate and assistant professors) have a PhD. Teachers of the IPD Master’s programme reported a lack of teachers who combine a PhD degree and design experience.

The composition of the lecturing team is broad, and the range of expertise available suffices for handling the contents of the Master’s programme.

The IDE Faculty applies a procedure according to which educational performance is part of the annual staff performance review (R&O cycle). The intention is to give the evaluation results a formal place in the R&O cycle. A university job classification exercise was started in 2004 in support of the procedure.

Newly appointed teaching staff and those already appointed in 2003, 2004 and 2005 have to attend the TU Delft ‘Basic Teaching Qualification’ course. A variety of circumstances, the reorganization of the Education and Student Affairs Department (ESAD) and more in particular within the Personnel Department, have limited the progress of this plan. A project leader to drive these activities was appointed in May 2006, and agreements have been made for six persons a year (two from each department of the Faculty) to attend the course.

Some students expressed the wish to see more teachers – inspiring role models – from the professional world involved in the teaching process.

Although the faculty is aiming at an increase of the numbers of teaching staff, a delay in the didactic training of existing teachers was observed.

The score for this Facet is ‘Good’.

**The overall score for Topic 3 is ‘Sufficient’**.

### 2.4.4. Facilities and provisions (Topic 4)

#### F15: Material facilities
The accommodation and material facilities are sufficient to implement the programme.

The IDE Faculty now resides in a modern building with facilities very well tailored to a design-oriented degree programme. The building contains student-oriented facilities like design studios, lecture theatres, computer rooms, freehand drawing rooms, the Model Making and Machine Shop, the Laboratory for Product Analysis, research and test rooms and the Industrial Design Engineering Library.

Some students expressed the opinion that the facilities do not offer enough room for private study, an observation that was confirmed by the teaching staff of the Master’s programmes. The Faculty is currently putting considerable effort into the improvement of private study, graduation and laptop workplaces.
Through Blackboard, the TU Delft standard electronic learning environment, the students have access to 90% of the course-related information. The electronic learning environment also provides exercises and examinations and supports communication between lecturers and students.

ICT hardware and 3D-printing facilities are very much appreciated by the Master’s students. On the other hand, consensus existed about the lack of illustration/presentation software (for example ‘Illustrator’) and lectures teaching its use.

The score for this Facet is ‘Good’.

F16: Student support and guidance

• The student support and guidance, as well as the information given to students are adequate for the purpose of students’ progress.
• The student support and guidance, as well as the information given to students meet the requirements of the students.

The student support and guidance system for Master’s students is aimed at adequate study progress, removing obstacles, improving study management, providing information and familiarising foreign and transfer students.

Under the heading of systematic counselling, several sessions are organised. An introductory session for all foreign and transfer students is organised to cover a wide variety of practical information on studying IDE at TU Delft.

An introductory lecture is given on the first day of the new academic year to explain what students may and may not expect from the Master’s programme and vice versa.

A system of student mentors is in operation for international students (and for the first-year Bachelor’s students). A senior student, under supervision of the international coordinator and the study advisor, arranges a socio-cultural programme for international students.

Students who perform marginally well or poorly are invited for an interview with the Master’s Coordinator in the second semester.

Individual counselling is provided on request, to deal with a wide variety of subjects ranging from administrative and progress problems to career-related issues and socio-psychological and medical problems.

Further support is given through the course “Preparation for Graduation” to assist the student in selecting and starting up the graduation project. Master’s students are supported in their preparation for the labour market through the course “Professional Design Practice”.

Despite these efforts, some foreign students expressed the opinion that the web-based information about the IDE Master’s programmes can be improved, e.g. with examples of projects. Moreover, they experienced a lack of support upon arrival and during the early phases of their study.

Blackboard, the electronic learning environment, provides students with on-line access to their registered examination results and grading. The Service Point information desk provides students with information about enrolment, timetable changes, events, lectures, etc.
The students consider the support and guidance procedures and systems in line with their needs.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 4 is ‘Sufficient’.

2.4.5. Internal quality assurance (Topic 5)

F17: Evaluation of results
The degree course is subject to a periodic review, which is partly based on verifiable targets.

The Internal Quality Assurance System applied for the IDE programme is based on the concept of the TU Delft-wide developed quality assurance system. The system offers a definition of quality, i.e. the degree to which the objectives of the degree programme are realized, and the associated IDE Faculty quality standards. Furthermore, the system provides a set of quality monitoring instruments (for example, the SENSOR enquêtes for course monitoring), a procedure for the follow-up of monitoring results and a description of relevant organizational responsibilities. The system is applied to the IDE Bachelor’s and Master’s programmes.

Both the semester and each course are subject to evaluation. The semester evaluation is the highest evaluation level of the IDE IQA system. In addition, evaluations are carried out for the results of teaching, student time-keeping, facilities, complaint procedures and student exit interviews.

A professional self-assessment report, presenting an evaluation of and action plan for each facet and topic, is one of the products of the IQA system.

Criteria have been defined for the IDE Bachelor’s and Master’s graduates in terms of the final achievement levels of the degree.

Targets have been defined for the quantitative results of the Bachelor’s and the Master’s education processes.

The score for this Facet is ‘Sufficient’.

F18: Measures to effect improvement
The results of this evaluation form the basis for measures that can be demonstrated to improve the course and that will contribute to reaching the targets.

The recommendations of the previous educational evaluation (VSNU report May 2002) have been followed up carefully. The Faculty has undertaken to resolve a sizable list of specific actions since the last visit, and the majority of the recommendations has been implemented. This resulted, for example, in the Faculty’s independence in 2004 and in the introduction of a new Bachelor’s programme that will be implemented in the academic year 2007/2008.
Following the successful implementation of the new Bachelor’s programme, the Faculty intends to review the Master’s education at the programme level in a similar way as done for the Bachelor’s programme.

The Educational Advisor discusses the outcomes of evaluations with the lecturer in question. A summary of the evaluation results, the person’s response and the agreed actions for improvement are documented and submitted to the Board of Education. Where evaluations show results below target, a follow-up survey is scheduled for the following year. The initiative for follow-up rests with the Educational Advisor, a delegated responsibility from the DoE. Reference is made to the list of improvement projects shown in the self-evaluation document, specifying the scope, responsible person and completion date.

Course evaluations have led to an introduction day for foreign students.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F19: Involvement of staff, students, alumni and the professional field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff, students, alumni and the professional field in which graduates of the course are to be employed are actively involved in the internal quality assurance.</td>
</tr>
</tbody>
</table>

Teaching staff and students are actively involved in all phases of the quality assurance process. The full Board of Education approves the IQA activity plan developed by the Educational Advisor.

A very strong network exists for student representation, consisting of the ID society, the OKIO, an active study association, and response groups.

The self-evaluation report was communicated with a focus group and, at a later date, with the Faculty Council, the ID society and several other stakeholder groups.

The professional field is involved through the WO-monitor (alumni) and through the Educational Advisory Committee, which represents and arranges further systematic involvement of the professional field.

The score for this Facet is ‘Good’.

**The overall score for Topic 5 is ‘Sufficient’**.

### 2.4.6. Results (Topic 6)

<table>
<thead>
<tr>
<th>F20: Level that has been achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications that have been achieved correspond to the targets set for the final qualifications in level, orientation and domain-specific requirements.</td>
</tr>
</tbody>
</table>

The Committee interviewed a selection of alumni who felt properly equipped for their job in the professional practice and saw a wide selection of graduation projects.
The Committee specifically reviewed nine TU Delft Master’s theses as part of this evaluation. In all but two cases, the scores awarded by the Committee were in line with the scores awarded by the Faculty. In one of the two cases, the Committee score was higher, and in the other case the Committee score was lower than the score awarded by the Faculty. The Committee is aware of the fact that their review of the selection of theses is only part of the full final assessment of the competencies achieved by a particular student. Based on the theses reviewed, the Committee is of the opinion that the Master’s graduates have achieved the final qualifications. The use of the English language in the theses should be improved.

The score for this Facet is ‘Sufficient’.

F21: Success rates
To measure the success rates, target figures have been set in comparison with relevant other degree courses. The success rates meet these targets.

The Faculty has set an explicit target figure for the Master’s student pass rate: 40% in two years. The 3TU Science and Technology plan sets an ultimate pass rate of 90% of the incoming Master’s students.

Insufficient figures are available since 2003 to assess whether the ultimate 3TU pass rate will be achieved. The 40% pass rate after 2 years has not been met after 2.5 years. Several reasons exist for the ‘below target’ pass rate. The first one is that many students start the Master’s programme when they still lack 30 EC in the Bachelor’s programme. Next, some students opt to attend university courses abroad or chose an internship abroad (as an elective) in addition to the 120 EC Master’s programme. Sometimes students lose quite some time finding a foreign company for their graduation project. Finally, in many cases it is the student’s own choice to spend more than the nominal time to complete the Master’s programme.

Plans to further improve the Master’s pass rates have been identified by the Faculty and consist of completion of a time-keeping survey started in 2006, a studyability investigation for which a grant has been obtained, and the ‘hard cut’ policy to be introduced by the Executive Board in 2010, under which a student is only allowed to start the Master’s programme when the Bachelor’s programme is completed.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 6 is ‘Sufficient’.
2.5. The assessment Protocol TU Delft IDE MSc DfI

2.5.1. Objectives of the degree courses (Topic 1)

F1: Domain-specific requirements
The final qualifications of the degree course correspond to the requirements made to a degree course in the relevant domain (field of study/discipline and/or professional practice) by colleagues in the Netherlands and abroad and the professional practice.

The Delft Industrial Design Engineering degree programme is the oldest of its kind in the field of industrial design engineering, and has existed for more than 35 years. In 1969, an independent ‘Technical and Industrial Design’ course started and carried its own engineering qualification. In 1981 the engineering certificate and the bridging department were renamed ‘Industrial Design Engineering’, leading to the Faculty of Industrial Design Engineering of TU Delft in 1986. In 1997 the Faculty of Industrial Design Engineering and the Faculty of Mechanical Engineering and Marine Technology merged to form the Faculty of Design, Engineering and Production. The merger was not to the liking of many in the Faculty and led to an independent faculty of Industrial Design Engineering (IDE) in 2004, teaching and conducting research on industrial design engineering. Several international academic universities have used the TU Delft IDE degree programme as a model for the development of their own programme.

The field of Industrial Design Engineering is currently evolving from a set of mono-disciplinary sciences to a trans-disciplinary science, exceeding the level of inter-disciplinarity.

The mission the Faculty of Industrial Design Engineering has chosen reads: “to contribute to the knowledge, skills, methods and professional attitudes in the field of integrated product development”. The Faculty aims to accomplish this mission through: “education and research at an internationally recognised scientific level”.

The concern of the Faculty is: “to study, innovate and improve the development of durable products and their related services for people, on the basis of the balanced interests of users, industry, society and the environment”.

In the academic year 2003/2004 the TU Delft IDE Faculty started three Master’s programmes: ‘Integrated Product Design’ (IPD), ‘Design for Interaction’ (DfI) and ‘Strategic Product Design’ (SPD). The DfI Master’s programme can be considered as a specialization of the IDE degree programme. The programme is built on a clear framework of objectives and specialises in analysing, conceptualising and designing for human-product interactions in relation to the physical, cultural, technological and societal contexts in which the product is used. The programme thus builds on the traditional disciplines of ergonomics and aesthetics, on interaction design and on experience design.

This DfI profile has been translated into achievement levels (or final qualifications) for the degree programme. Use was made of the booklet Criteria for Academic Bachelor’s and Master’s Curricula which was written by the three technical universities of the Netherlands (3TU), describing the general achievement level specification for an academic engineer.

The programmes of Industrial Design Engineering of the 3TU have defined the competencies and labour market positions of IDE graduates and the distinction between Bachelor’s and Master’s level in a common domain-specific reference frame (DSRK).
The Faculty decided in 2005 to perform an international benchmark survey. The benchmark survey revealed that only a few institutes have seriously developed an IDE Master’s programme. To the extent that it was possible to compare programmes, it could be concluded that the achievement levels of the DfI Master’s programme corresponded with the requirements made of similar degree courses in the relevant domain by colleagues in the Netherlands and abroad. Moreover, the DfI Master’s programme stands out with respect to: 1) interaction and the associated study components, and 2) the Faculty’s research orientation to ‘design for interaction’. The Faculty’s authority in the international field in this respect was also apparent at the second International Engineering and Product Design Education Conference (IEPDE) held in September 2004 in the Netherlands.

The Educational Advisory Committee (EAC), representing the professional field, plays an important role in the external assessment of the achievement levels of the Master’s programme on the Faculty’s behalf.

The score for this Facet is ‘Good’.

F2: Level

The final qualifications of the degree course correspond to general, internationally accepted descriptions of the qualifications of a Bachelor or a Master.

The achievement levels of the DfI IDE Master’s programme of the Delft University of Technology (TU Delft) have been defined in line with the booklet *Criteria for Academic Bachelor’s and Master’s Curricula*. These criteria are formally accepted by NVAO as a more expanded and relevant statement of the Dublin Descriptors, which must be respected as required by the QANU protocol. By having developed and implemented these criteria, the three Dutch universities of technology stand out positively from other universities in the Netherlands.

The criteria describe in detail the distinction in level between academic Bachelor’s and Master’s degrees, and also the range of intellectual attributes and understanding of contexts that a trained engineer may require, depending on career direction. Therefore, these criteria are more suitable for a specific qualitative examination of the Bachelor’s and Master’s programmes concerned than the Dublin Descriptors.

As the formulation of the DfI Master’s programme achievement levels is largely based on the *Criteria for Academic Bachelor’s and Master’s Curricula*, compliance with the Dublin Descriptors is assured.

Based on the analysis performed by the Faculty and the verification carried out by the Committee, it can be concluded that the final qualifications of the degree courses meet the requirements laid down in the Dublin Descriptors.

The score for this Facet is ‘Good’. 
F3: Orientation
The final qualifications of the degree course correspond to the following descriptions of a Bachelor and a Master at universities:

- The final qualifications are based on requirements made by the academic discipline, the international academic practice and, if applicable to the course, the relevant practice in the prospective professional field.
- A University (WO) bachelor possesses the qualifications that allow access to a minimum of one further University (WO) degree course at master’s level as well as the option to enter the labour market.
- A University (WO) master possesses the qualifications to conduct independent academic research or to solve multidisciplinary and interdisciplinary questions in a professional practice for which a University (WO) degree is required or useful.

The DfI Master’s programme achievement levels (final qualifications) match the requirements of the national academic discipline, the international academic practice and the prospective professional field as described under Facets 1 and 2 above.

Master’s students who wish to specialise in DfI research have the opportunity to carry out projects with a research focus. The DfI Master’s graduate has ample opportunity to continue a PhD study. At the time of the evaluation, the IDE departments counted 58 PhD students, of whom 17 held an IDE Master’s degree from TU Delft. An increasing number of graduates opt for an academic career within the university or in a research organisation like TNO.

A recent alumni survey evidenced the high esteem for the qualities of graduates. The position on the labour market of the DfI Master’s graduates is good due to their capability to conduct independent academic research and/or to resolve multidisciplinary and interdisciplinary questions. The graduates find work in design offices and in industry as well as in organisations where the phenomenon of interaction is important.

The score for this Facet is ‘Good’.

The overall score for Topic 1 is ‘Sufficient’.

2.5.2. Programme (Topic 2)

F4: Requirements for university degree courses
The programme meets the following criteria applicable to a degree programme at a University (WO):

- The students acquire knowledge on the interface between teaching and academic research within the relevant disciplines;
- The programme follows the developments in the relevant academic discipline(s), as it is demonstrated that it incorporates current academic theories;
- The programme ensures the development of skills in the field of academic research;
- For those courses for which this is applicable, the course programme has clear links with the current professional practice in the relevant professions.

A uniform educational structure has been defined for the three IDE Master’s programmes. The structure consists of joint courses to be taken by all Master’s students, an integral design project (joint assignment) in which the students of the three Master’s programmes work jointly on a design task, courses specific to the Master’s programme, elective courses and the final project. The joint courses cover Design Theory and Methodology, Applied Research Methods and Techniques in Design, Professional Design Practice, and Preparation for Graduation.
The joint design assignment covers the entire design process in which the students solve a complex design problem for a client in the professional practice while focusing on specific elements of their track (IPD, DFI or SPD). Each of the Master’s programmes has a package of specific courses that focus on elements of the programme concerned. The courses are accompanied by specific projects, two for each programme, in which the students learn to apply the course material and place it in the correct context. The programme also includes electives (18 EC), enabling the students to deepen their understanding of particular aspects. It is traditional for the final project (30 EC) to be performed mainly with and for industry or other organisations outside the Faculty. However, in recent years, interest has been growing among Master’s students for a research-oriented graduation project either within the Faculty or within the Delft Design Institute.

The ‘Preparation for Graduation’ course was introduced to extend the support provided to students for this part of their study. Each Master’s programme relates to specific research programmes, the output of which have a place in the Master’s courses (lectures and assignments). A close link exists in the DFI programme between education and research, as the majority of the courses have a strong research focus. Also a close link exists in the DFI programme between Master’s and PhD students. Students develop part of their knowledge through both links and become familiar with active research, preparing for a PhD as required.

The Educational Advisory Committee, is systematically consulted for feedback on the learning objectives and programme requirements. Guest lecturers, part-time lecturers liaised with design firms or industrial companies, and assignments that reflect the professional practice, and the joint ‘Professional Design Practice’ course give students an opportunity to form a view of their future occupational field.

The IDE Master’s programmes have a clear format and framework of objectives in which ample attention is paid to research and to the professional practice.

The score for this Facet is ‘Good’.

**F5: Relationship between aims and objectives and contents of the programme**

- The course contents adequately reflect the final qualifications, both with respect to the level and orientation, and with respect to domain-specific requirements.
- The final qualifications have been translated adequately into learning targets for the programme or its components.
- The contents of the programme offer students the opportunity to obtain the final qualifications that have been formulated.

Students learn how to integrate specialist knowledge from the humanities and behavioural sciences into design parameters and thus develop concepts for new products. They learn to translate existing and new technologies, such as product intelligence, sensors and new materials, into design opportunities. They also learn how to involve users in analysing needs, generating concepts and testing prototypes in relation to the physical, cultural, technological and societal contexts in which the product will be used.

The curriculum gives students an opportunity to specialise in designing products that are related to the medical/rehabilitation field (the specialisation Medisign), mobility (the Auto-
motive specialisation) or design research. Consequently, the programme key words cover the relevant fields like interactive technology, product understanding, user-centered studies, visual communication, concept development and concept testing.

The programme objectives have been translated into achievement levels (or final qualifications) for the degree programme. These achievement levels were used as input in shaping the curriculum. All courses and projects have defined learning goals which are related back to the achievement levels of the DfI Master’s programme. It is the Committee’s opinion that the contents of the courses and projects are adequate to achieve the defined objectives. By mapping the learning goals of the courses and projects against the competencies to be achieved, the Faculty has demonstrated that the final qualifications are achieved upon successful completion of the DfI Master’s programme.

The programme’s structure and underlying theme of the design and graduation projects are described under Facet 4 above.

The score for this Facet is ‘Good’.

<table>
<thead>
<tr>
<th>F6: Coherence of the programme</th>
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<tbody>
<tr>
<td>Students follow a programme of study that is coherent in its contents.</td>
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</tbody>
</table>

Coherence of the DfI Master’s programme is achieved in two ways:

- Coherence within the programme: the knowledge and skills acquired in the first Master’s year are applied to the Integral Design Project and Graduation Project, both done in the second Master’s year.
- Coherence within a semester in the first year: the match between and relevance of the courses and projects within a semester; for example, the students in the investigation phase of Usability Testing and Redesign Project have to choose from the research techniques learned and practised in the Observational Research course.

The course and semester evaluations show that students in general understand the relevance of the courses and the prerequisites.

Some students expressed the opinion that more emphasis should be laid on theory and less on the projects.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F7: Study load</th>
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</thead>
<tbody>
<tr>
<td>The programme can be successfully completed within the set time, as certain programme-related factors that may be an impediment to study progress are removed as much as possible.</td>
</tr>
</tbody>
</table>

An even distribution of the study load was the objective when the IDE Master’s curricula were developed. Hourly schedules facilitated the alignment and distribution of courses and projects on a weekly basis.
The proactive annual check by the ESAD Department of the hourly schedules as part of the study guide update was last done for the academic year 2005/2006 and was stopped with the introduction of the TU Delft-wide digital study prospectus. The Faculty will raise this issue in order to re-implement this check for the academic year 2007/2008.

The Faculty reactively checks the study load distribution in two ways, i.e through course evaluations and time-keeping surveys, both part of its Internal Quality Assurance (IQA) system.

Students generally experience the IDE Master’s programmes as demanding. The course evaluation showed that students in general find the actual study load consistent with the planned study load. Looking at the course pass rates, there appears to be no permanent obstacles in the Dfl Master’s programme.

Despite all proactive and reactive measures in relation to the study load, the average time for students to complete the Bachelor’s and Master’s programmes exceeds the nominal time, which in many cases due to the individual student’s personal choice.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F8: Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>The structure and contents of the programme are in line with the qualifications of the students that embark on the degree course:</td>
</tr>
<tr>
<td>• Bachelor’s degree at a University (WO): VWO (pre-university education), propaedeutic certificate from a University of Professional Education (HBO) or similar qualifications, as demonstrated in the admission process.</td>
</tr>
<tr>
<td>• Master’s degree at a University (WO): bachelor’s degree and possibly selection (on contents of the subject).</td>
</tr>
</tbody>
</table>

The majority of the intake in the TU Delft IDE Dfl Master’s programme consists of students who recently completed their IDE Bachelor’s programme at TU Delft. Together with IDE Bachelor’s graduates from UT and TU/e, they have unconditional access. BSc university graduates from Dutch degree programmes other than IDE have various options: unconditional transfer, transfer with a number of requirements, transfer with a bridging course, or no transfer possible.

Bachelor’s graduates in IDE and allied programmes of Dutch polytechnics and other students who have been admitted to the bridging course and have successfully completed it are admitted to the IDE Master’s programme as well. In September 2007 a pilot started involving a TU Delft IDE bridging course in the minor profile of the university of professional education (hbo) degree programme.

IDE Bachelor’s graduates from outside the Netherlands are admitted on the basis of the outcome of a selection (including both grades and portfolio) and programme review process in which the most important criterion is that they must be able to obtain a degree within two years. The latter rules out full bridging courses, but a number of prescribed courses may be required.

The intake number of foreign students is increasing. Requests for admission to a Master’s programme continue to be assessed on an individual basis. A dilemma still surrounds the requirement that once a Bachelor’s student from the TU
Delft IDE Bachelor’s programme has obtained 150 EC (first and second year and half of the third year), he/she is admitted to IDE Master’s courses. The Executive Board is considering implementing by 2010 the so-called ‘hard-cut’, meaning that a Bachelor’s student must have obtained all the credits of the Bachelor’s programme - 180 EC - before he/she is admitted to the IDE Master’s programme. This is a normal requirement for transfer and foreign students. The implementation of a clear separation between the entrance to the Master’s programme and the Bachelor’s graduation will be accompanied by a double challenge: 1) to prevent further study delay and 2) to stop Bachelor’s graduates dropping out before moving to the Master’s programme, for example because they accepted a job while waiting to complete their Bachelor’s programme. On the other hand, it will create equal conditions in comparison with students coming from other Dutch and foreign universities and enable and encourage students to consider mobility after the Bachelor’s phase.

Information about the DfI Master’s programme is available in brochures and on the web. To become familiar with the Master’s programme, potential students can attend the spring and autumn information days. In addition, Master’s lunches for Bachelor’s transfer students and professional education students are held. Finally, one-to-one talks with a study advisor are offered to inform potential student about the programme and career prospects.

The score for this Facet is ‘Sufficient’.

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**F9: Duration**
The degree course complies with formal requirements regarding the size of the curriculum:
- Bachelor of a University (WO): 180 credits as a rule.
- Master of a University (WO): a minimum of 60 credits, dependent on the relevant degree course.

The Master’s curriculum has a study load of 120 EC and a nominal study duration of two years.

The curriculum size of the Master’s programme is in accordance with the European Credit Transfer System (ECTS).

The score for this Facet is ‘Sufficient’.

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**F10: Coordination of structure and contents of the degree course**
- The didactic concepts are in line with the aims and objectives.
- The teaching methods correspond to the didactic concept.

The teaching of knowledge and insight runs largely synchronous with their application. This didactic concept was adopted for all three IDE Master’s programmes, consistent with the didactic concept of the Bachelor’s programme: “learning to apply and integrate knowledge and skills in various situations, a mix of teaching formats and continued development of independence and self-reliance on the part of the student”. In that concept the design projects form an underlying theme throughout the curriculum. The same project-based form of design education as for the Bachelor’s programme is used in the IDE Master’s programmes.

An important factor in the formulation of the Master’s programmes has been the fact that various intake groups had to be considered.
Two-thirds of the study load of the first Master’s year are devoted to practicals, assignments and projects. Self-study and lectures form the rest of the study load. The second half of the second Master’s year is entirely devoted to the graduation project.

The semester evaluations have shown that the students in general appreciate the structure of the Master’s programme: courses and projects running in parallel and a mix of teaching formats in the first Master’s year.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F11: Assessments and examinations</th>
</tr>
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<tbody>
<tr>
<td>The system of assessments and examinations provides an effective indication whether the students have reached the learning targets of the course programme or its components.</td>
</tr>
</tbody>
</table>

The IDE Faculty uses several examination and assessment methods in line with the objectives of the course concerned. The examination and assessment methods for each course, assignment and project are defined and documented in the Study Guide. In general, knowledge-based objectives are tested in a written examination. Courses with an emphasis on skills utilize practical training results or the presentation of a student portfolio as their examination method. The portfolio-related examinations generally involve a discussion between the assessor and the student in which the marks awarded are substantiated. The assessment of group projects and group assignments is based on the results of the group and on an individual assessment.

The examination regulations are formulated by the Board of Examiners (BoE). The opinion of the Teaching Committee and the Faculty Student Council are solicited, after which the examination regulations are adopted by the Dean of the Faculty.

The regulations include a clause on the right of students to inspect their examination results. This right is exercised and leads sporadically to a formal protest (less than once a year for the Bachelor’s and Master’s programmes together).

Some students remarked that the feedback on projects was sometimes lacking, that assessment criteria are not always clear (“fuzzy grading”) and that assessment and examination results are not always published on Blackboard. It was mentioned that no reflection was provided on the project group processes.

The score for this Facet is ‘Sufficient’.

**The overall score for Topic 2 is ‘Sufficient’**.
2.5.3. Deployment of staff (Topic 3)

F12: Requirements for University
The degree course meets the following criteria for the deployment of staff for a degree course at a University (WO):
Teaching is largely provided by researchers who contribute to the development of the subject area.

The teaching in the IDE Faculty is provided by academic staff (full, associate and assistant professors of whom 60% have a PhD) and lecturers (usually employed part-time in the faculty alongside employment in the professional practice). The policy of the IDE Faculty is that as many staff members as possible should combine teaching and research. The proportion doing so was 65% in September 2006. This approach ensures that the teaching is nourished by researchers. A strong research programme is in place, the quality of which was recognised during the last research visit and by the annual Research Advisory Board meeting.

From the first year on students come into contact with professors and PhD staff with lecturing duties.

The recruitment of part-time staff is a deliberate strategy to involve practising professionals and leading designers in the IDE Master’s programmes.

The score for this Facet is ‘Good’.

F13: Quantity of staff
The staff levels are sufficient to ensure that the course is provided to the required standards.

The figures presented in this section apply to the combined staff of the Bachelor’s and Master’s programmes. Currently, a total of 63.7 fte of IDE staff is available for education, from a total of 154.74 fte. When the staff from other faculties teaching in the IDE programmes is counted as well, 68 fte are available for education. These numbers illustrate the target for academic staff that the time distribution for education, research and overhead approximately equals 40/40/20%. Currently, the student to staff ratio for IDE amounts to 25.5 (average 27 over the last three years) including the external fte from the other faculties.

The average student to staff ratio of 27 is slightly lower than that of the IDE Faculty of UT (29.9) and favourable when compared with e.g. Erasmus University and Tilburg University.

It was confirmed by the teachers that some vacancies were open too long.

The score for this Facet is ‘Sufficient’.

F14: Quality of staff
The staff is sufficiently qualified to ensure that the aims regards contents, didactics and organization of the course programme are achieved.

Around 60% of the teaching staff (full, associate and assistant professors) have a PhD. Teachers of the Master’s programme reported a lack of teachers combining a PhD degree with design experience.
The composition of the lecturing team is broad, and the range of expertise available suffices for handling the contents of the Master’s programme.

The IDE Faculty applies a procedure according to which educational performance is part of the annual staff performance review (R&O cycle). The intention is to give the evaluation results a formal place in the R&O cycle. A university job classification exercise was started in 2004 in support of the procedure.

Newly appointed teaching staff and those already appointed in 2003, 2004 and 2005 have to attend the TU Delft ‘Basic Teaching Qualification’ course. A variety of circumstances, the reorganization of the Education and Student Affairs Department (ESAD) and more particularly within the Personnel Department, have limited the progress of this plan. A project leader to drive these activities was appointed in May 2006, and agreements have been made for six persons a year (two from each department of the Faculty) to attend the course.

Some students expressed the wish to see more teachers – inspiring role models – from the professional world involved in the teaching process.

Although the faculty is aiming at an increase of the numbers of teaching staff, a delay in the didactic training of existing teachers was observed.

The score for this Facet is ‘Good’.

**The overall score for Topic 3 is ‘Sufficient’**.

### 2.5.4. Facilities and provisions (Topic 4)

<table>
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<tr>
<th>F15: Material facilities</th>
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<tbody>
<tr>
<td>The accommodation and material facilities are sufficient to implement the programme.</td>
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</table>

The IDE Faculty now resides in a modern building with facilities very well tailored to a design-oriented degree programme. The building contains student-oriented facilities like design studios, lecture theatres, computer rooms, freehand drawing rooms, the Model Making and Machine Shop, the Laboratory for Product Analysis, research and test rooms and the Industrial Design Engineering Library.

Some students expressed the opinion that the facilities do not offer enough room for private study, an observation that was confirmed by the teaching staff of the Master’s programmes. The Faculty is currently putting considerable effort into improving private study, graduation and laptop workplaces.

Through Blackboard, the TU Delft standard electronic learning environment, the students have access to 90% of the course-related information. The electronic learning environment also provides exercises and examinations and supports communication between lecturers and students.

ICT hardware and 3D printing facilities are very much appreciated by the Master’s students. On the other hand, consensus existed about the lack of illustration/presentation software (for example ‘Illustrator’) and lectures teaching its use.

The score for this Facet is ‘Good’.
The student support and guidance system for Master’s students is aimed at adequate study progress, removing obstacles, improving study management, providing information and familiarising foreign and transfer students.

Under the heading of systematic counselling, several sessions are organised. An introductory session for all foreign and transfer students is organised to cover a wide variety of practical information on studying IDE at TU Delft.

An introductory lecture is given on the first day of the new academic year to explain what students may and may not expect from the Master’s programme and vice versa.

A system of student mentors is in operation for international students (and for the first-year Bachelor’s students). A senior student, under supervision of the international coordinator and the study advisor, arranges a socio-cultural programme for the international students.

Students who perform marginally well or poor are invited for an interview with the Master’s Coordinator in the second semester.

Individual counselling is provided upon request, to deal with a wide variety of subjects ranging from administrative and progress problems to career-related issues and socio-psychological and medical problems.

Further support is given through the course “Preparation for Graduation” to assist the student in selecting and starting up the graduation project. The Master’s student is supported in his/her preparation for the labour market through the course “Professional Design Practice”.

Despite these efforts, some foreign students indicated that the web-based info about the IDE Master’s programmes could be improved, e.g. with examples of projects. Moreover, they experienced a lack of support upon arrival and during the early phases of their study.

Blackboard, the electronic learning environment, provides students with on-line access to their registered examination results and grading. The Service Point information desk provides students with information about enrolment, timetable changes, events, lectures, etc.

The students consider the support and guidance procedures and systems adequate.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 4 is ‘Sufficient’.
### 2.5.5. Internal quality assurance (Topic 5)

<table>
<thead>
<tr>
<th>F17: Evaluation of results</th>
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<tbody>
<tr>
<td>The degree course is subject to a periodic review, which is partly based on verifiable targets.</td>
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</table>

The Internal Quality Assurance System applied to the IDE programme is based on the concept of the TU Delft-wide developed quality assurance system. The system offers a definition of quality, i.e. the degree to which the objectives of the degree programme are realized, and the associated IDE Faculty quality standards. Furthermore, the system provides a set of quality monitoring instruments (for example, the SENSOR enquetes for course monitoring), a procedure for the follow-up of monitoring results and a description of relevant organizational responsibilities. The system is applied to the IDE Bachelor’s and Master’s programmes.

Both the semester and each course are subject to evaluation. The semester evaluation is the highest evaluation level of the IDE IQA system. In addition, evaluations are carried out for the results of teaching, student time-keeping, facilities, complaint procedures and student exit interviews.

A professional self-assessment report, presenting an evaluation of and action plan for each facet and topic, is one of the products of the IQA system.

Criteria have been defined for the IDE Bachelor’s and Master’s graduates in terms of the final achievement levels of the degree.

Targets have been defined for the quantitative results of the Bachelor’s and the Master’s education processes.

The score for this Facet is ‘Sufficient’.

<table>
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<tr>
<th>F18: Measures to effect improvement</th>
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</thead>
<tbody>
<tr>
<td>The results of this evaluation form the basis for measures that can be demonstrated to improve the course and that will contribute to reaching the targets.</td>
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</table>

The recommendations of the previous educational evaluation (VSNU report May 2002) have been followed up carefully. The Faculty has undertaken to resolve a sizable list of specific actions since the last visit, and the majority of the recommendations has been implemented. This resulted, for example, in the Faculty’s independence in 2004 and the introduction of a new Bachelor’s programme that will be implemented in the academic year 2007/2008.

Following the successful implementation of the new Bachelor’s programme, the Faculty intends to review the Master’s education at the programme level in a similar way as done for the Bachelor’s programme.

The Educational Advisor discusses the outcomes of evaluations with the lecturer in question. A summary of the evaluation results, the person’s response and the agreed actions for improvement are documented and submitted to the Board of Education. Where evaluations show results below target, a follow-up survey is scheduled for the following year. The initiative for follow-up rests with the Educational Advisor, a delegated responsibility from the DoE.
Reference is made to the list of improvement projects shown in the self-evaluation document, specifying the scope, responsible person and completion date. Course evaluations have led to an introduction day for foreign students.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F19: Involvement of staff, students, alumni and the professional field</th>
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<tbody>
<tr>
<td>Staff, students, alumni and the professional field in which graduates of the course are to be employed are actively involved in the internal quality assurance.</td>
</tr>
</tbody>
</table>

Teaching staff and students are actively involved in all phases of the quality assurance process. The full Board of Education approves the IQA activity plan developed by the Educational Advisor.

A strong network exists for student representation consisting of the ID society, the OKIO, an active study association, and response groups.

The self-evaluation report was communicated with a focus group and, at a later date, with the Faculty Council, the ID society and several other stakeholder groups.

The professional field will be involved through the WO-monitor (alumni) as soon as sufficient DfI Master’s students have found employment in the market. The Educational Advisory Committee represents and arranges further systematic involvement of the professional field.

The score for this Facet is ‘Good’.

**The overall score for Topic 5 is ‘Sufficient’.

**2.5.6. Results (Topic 6)**

<table>
<thead>
<tr>
<th>F20: Level that has been achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications that have been achieved correspond to the targets set for the final qualifications in level, orientation and domain-specific requirements.</td>
</tr>
</tbody>
</table>

The Committee interviewed a selection of alumni who felt sufficiently equipped for their job in the professional practice and saw a wide selection of graduation projects. The Committee specifically reviewed nine TU Delft Master’s theses as part of this evaluation. In all but two cases, the scores awarded by the Committee were in line with the scores awarded by the Faculty. In one of the two cases, the Committee score was higher, and in the other case the Committee score was lower than the score awarded by the Faculty. The Committee is aware of the fact that their review of the selection of theses is only part of the full final assessment of the competencies achieved by a particular student. Based on the theses reviewed, the Committee is of the opinion that the Master’s graduates have achieved the final qualifications. The use of the English language in the theses should be improved.

The score for this Facet is ‘Sufficient’.
The Faculty has set an explicit target figure for the Master's student pass rate: 40% in two years. The 3TU Science and Technology plan sets an ultimate pass rate of 90% of the incoming Master's students.

Insufficient figures are available since 2003 to assess whether the ultimate 3TU pass rate will be achieved. The 40% pass rate after 2 years was not met after 2.5 years. Several reasons exist for the ‘below target’ pass rate. The first one is that many students start the Master's programme while still lacking 30 EC in the Bachelor's programme. Next some students opt to attend university courses abroad or chose an internship abroad (as an elective) in addition to the 120 EC Master's programme. Sometimes students lose quite some time finding a foreign company for their graduation project. Finally, in many cases it is the student's own choice to spend more than the nominal time to complete the Master's programme.

Plans to improve the Master's pass rates further have been identified by the Faculty and consist of the completion of a time-keeping survey started in 2006, a studiability investigation for which a grant has been obtained, and the ‘hard cut’ policy to be introduced by the Executive Board in 2010, under which a student is only allowed to start the Master's programme when the Bachelor's programme is completed.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 6 is ‘Sufficient’.
2.6. The Assessment Protocol TU Delft IDE MSc SPD

2.6.1. Objectives of the degree courses (Topic 1)

<table>
<thead>
<tr>
<th>F1: Domain-specific requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications of the degree course correspond to the requirements made to a degree course in the relevant domain (field of study/discipline and/or professional practice) by colleagues in the Netherlands and abroad and the professional practice.</td>
</tr>
</tbody>
</table>

The Delft Industrial Design Engineering degree programme is the oldest of its kind in the field of industrial design engineering and has existed for over 35 years. In 1969, an independent ‘Technical and Industrial Design’ course started and carried its own engineering qualification. In 1981 the engineering certificate and the bridging department were renamed ‘Industrial Design Engineering’, leading to the Faculty of Industrial Design Engineering of TU Delft in 1986. In 1997 the Faculty of Industrial Design Engineering and the Faculty of Mechanical Engineering and Marine Technology merged to form the Faculty of Design, Engineering and Production. The merger was not to the liking of many in the Faculty and led to an independent faculty of Industrial Design Engineering (IDE) in 2004, teaching and conducting research on industrial design engineering. Several international academic universities have used the TU Delft IDE degree programme as a model for the development of their own programme.

The field of IDE is currently evolving from a set of mono-disciplinary sciences to a trans-disciplinary science, exceeding the level of inter-disciplinarity.

The mission the Faculty of Industrial Design Engineering has chosen reads: “to contribute to the knowledge, skills, methods and professional attitudes in the field of integrated product development”. The Faculty aims to accomplish this mission through: “education and research at an internationally recognised scientific level”.

The concern of the Faculty is: “to study, innovate and improve the development of durable products and their related services for people, on the basis of the balanced interests of users, industry, society and the environment”.

In the academic year 2003/2004 the TU Delft IDE Faculty started three Master’s programmes: ‘Integrated Product Design’ (IPD), ‘Design for Interaction’ (DfI) and ‘Strategic Product Design’ (SPD). The SPD Master’s programme can be considered a specialization of the IDE degree programme.

The programme is built on a clear framework of objectives: graduates are educated in the development of promising concepts for products or product-service combinations, based on a balance between insight into the company’s external factors and its objectives. One of the main themes of the programme is translating the chosen direction of the product strategy into proposals (concepts) for products. This SPD profile has been translated into achievement levels (or final qualifications) for the degree programme. Use was made of the report *Criteria for Academic Bachelor’s and Master’s Curricula* written by the three technical universities of the Netherlands (3TU) describing the general achievement level specification for an academic engineer.

The IDE programmes of the 3TU have defined the competencies and labour market positions of IDE graduates and the distinction between Bachelor’s and Master’s level in a common domain-specific reference frame (DSRK).
The Faculty decided in 2005 to perform an international benchmark survey. The benchmark survey revealed that only a few institutes have seriously developed an IDE Master’s programme. To the extent that it was possible to compare programmes, it could be concluded that the achievement levels of the SPD Master’s programme corresponded with the requirements made of similar degree courses in the relevant domain by colleagues in the Netherlands and abroad. Moreover, the SPD Master’s programmes stand out with respect to: 1) the - more than internationally usual - attention to design and research methodology, and 2) the emphasis on business aspects. The Faculty’s authority in the international field in this respect was also apparent at the second International Engineering and Product Design Education Conference (IEPDE) held in September 2004 in the Netherlands.

The Educational Advisory Committee (EAC), representing the professional field, plays an important role in the external assessment of the achievement levels of the Master’s programme on the Faculty’s behalf.

The score for this Facet is ‘Good’.

The achievement levels of the IDE SPD Master’s programme of TU Delft have been defined in line with the booklet *Criteria for Academic Bachelor’s and Master’s Curricula*. These criteria are formally accepted by NVAO as a more expanded and relevant statement of the Dublin Descriptors, which must be respected as required by the QANU protocol. By having developed and implemented these criteria, the three Dutch universities of technology stand out positively from other universities in the Netherlands.

The criteria describe in detail the distinction in level between academic Bachelor’s and Master’s degrees, and also the range of intellectual attributes and understanding of contexts that a trained engineer may require, depending on career direction. Therefore, these criteria are more suitable for a specific qualitative examination of the Bachelor’s and Master’s programmes concerned than the Dublin Descriptors. As the formulation of the SPD Master’s programme achievement levels is largely based on the *Criteria for Academic Bachelor’s and Master’s Curricula*, compliance with the Dublin Descriptors is assured.

Based on the analysis performed by the Faculty and the verification carried out by the Committee, it can be concluded that the final qualifications of the degree courses meet the requirements laid down in the Dublin Descriptors.

The score for this Facet is ‘Good’.
F3: Orientation

The final qualifications of the degree course correspond to the following descriptions of a Bachelor and a Master at universities:

• The final qualifications are based on requirements made by the academic discipline, the international academic practice and, if applicable to the course, the relevant practice in the prospective professional field.
• A University (WO) bachelor possesses the qualifications that allow access to a minimum of one further University (WO) degree course at master’s level as well as the option to enter the labour market.
• A University (WO) master possesses the qualifications to conduct independent academic research or to solve multidisciplinary and interdisciplinary questions in a professional practice for which a University (WO) degree is required or useful.

The SPD Master’s programme achievement levels (final qualifications) match the requirements of the national academic discipline, the international academic practice and the prospective professional field as described under Facets 1 and 2 above.

Master’s students who wish to specialise in SPD research have the opportunity to carry out projects with a research focus. The SPD MSc graduate has ample opportunity to continue a PhD study. At the time of the evaluation, the IDE departments counted 58 PhD students, of whom 17 held an IDE Master’s degree from TU Delft. An increasing number of graduates opt for an academic career within the University or in an research organisation like TNO.

A recent alumni survey evidenced the high esteem for the qualities of graduates. The position on the labour market of the SPD MSc graduate is good due to their capability to conduct independent academic research and/or resolve multidisciplinary and interdisciplinary questions. Graduates successfully perform their functions in both large and small companies, in industry or in design companies, or organisations where successful product development is important.

The score for this Facet is ‘Good’.

The overall score for Topic 1 is ‘Sufficient’.

2.6.2. Programme (Topic 2)

F4: Requirements for university degree courses

The programme meets the following criteria applicable to a degree programme at a University (WO):

• The students acquire knowledge on the interface between teaching and academic research within the relevant disciplines;
• The programme follows the developments in the relevant academic discipline(s), as it is demonstrated that it incorporates current academic theories;
• The programme ensures the development of skills in the field of academic research;
• For those courses for which this is applicable, the course programme has clear links with the current professional practice in the relevant professions.

A uniform educational structure has been defined for the three IDE Master’s programmes. The structure consists of joint courses to be taken by all Master’s students, an integral design project (joint assignment) in which the students of the three Master’s programmes work jointly on a design task, courses specific for the Master’s programme, elective courses and the final project. The joint courses cover Design Theory and Methodology, Applied Research Methods and Techniques in Design, Professional Design Practice, and Preparation for Graduation.
The joint design assignment covers the entire design process in which the students solve a complex design problem for a client in the professional practice while focusing on specific elements of their track (IPD, Dfl or SPD). Each of the Master’s programmes has a package of specific courses that focus on elements of the programme concerned. The courses are accompanied by specific projects, two for each programme, in which the students learn to apply the course material and place it in the correct context. Each programme also includes electives (18 EC), enabling the students to deepen their understanding of particular aspects. The students complete the Master’s programme with their final project (30 EC). It is traditional for the final project to be done mainly with and for industry or other organisations outside the Faculty. However, in recent years, interest is growing among Master’s students for a research-oriented graduation project within either the Faculty or the Delft Design Institute.

The ‘Preparation for Graduation’ course was introduced to extend the support provided to students for this part of their study. Each Master’s programme relates to specific research programmes, the output of which have a place in the Master’s courses (lectures and assignments). A close link exists in the SPD programme between education and research, as the majority of the courses have a strong research focus through which students develop part of their knowledge, become familiar with active research and can prepare for a PhD. Students interviewed confirmed the research focus of most of the courses.

The Educational Advisory Committee, is systematically consulted for feedback on the learning objectives and programme requirements. Guest lecturers, part-time lecturers liaising with design firms or industrial companies and assignments that reflect the professional practice, and the joint ‘Professional Design Practice’ course give students an opportunity to form a view of their future occupational field.

The IDE Master’s programmes have a clear format and framework of objectives in which ample attention is given to research and to the professional practice.

The score for this Facet is ‘Sufficient’.

F5: Relationship between aims and objectives and contents of the programme

- The course contents adequately reflect the final qualifications, both with respect to the level and orientation, and with respect to domain-specific requirements.
- The final qualifications have been translated adequately into learning targets for the programme or its components.
- The contents of the programme offer students the opportunity to obtain the final qualifications that have been formulated.

The objective is to transform students into strategic product developers. They learn how to develop promising product concepts based on insights from the company’s external environment and its objectives and opportunities. The translation of the chosen strategic product direction into proposals for product concepts will also be of central concern. The objective is spelled out and articulated very well. The emphasis of the Master’s programme is on international relations, strong ties with the Faculty’s research (Design Processes, Sustainability, Consumer Preference, and Product Advantage and Market Acceptance), commercial aspects in the product planning phase, and product and brand portfolios. The curriculum gives students an
opportunity to specialise in designing products that are related to mobility (the Automotive specialisation) or in strategic product design research.

Few other design programmes pay as much attention to the market, the brand, and the consumer. Likewise, there are few degree programmes in the field of market and management that address the specific issues surrounding products, markets and users.

The objective has been translated into achievement levels (or final qualifications) for the degree programme. These achievement levels were used as input in shaping the curriculum. All courses and projects have defined learning goals which are related back to the achievement levels of the SPD Master’s programme. It is the opinion of the Committee that the contents of the courses and projects are adequate to achieve the defined course and project objectives. By mapping the learning goals of the courses and projects against the competencies to be achieved, the Faculty has demonstrated that the final qualifications are achieved upon successful completion of the SPD Master’s programme.

The programme’s structure and underlying theme of the design and graduation projects are described under Facet 4 above.

The score for this Facet is ‘Good’.

<table>
<thead>
<tr>
<th>F6: Coherence of the programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students follow a programme of study that is coherent in its contents.</td>
</tr>
</tbody>
</table>

Coherence of the SPD Master’s programme is achieved in two ways:

- Coherence within the programme: the knowledge and skills acquired in the first year are applied in the Integral Design Project and in the Graduation Project, both done in the second year.
- Coherence within a semester in the first year: the match between and relevance of the courses and projects within a semester, for example, the knowledge and skills from Brand and Product Strategy, are integrated into and applied in the Design Strategy Project.

The course and semester evaluations show that students, in general, understand the relevance of the courses for the degree programme.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F7: Study load</th>
</tr>
</thead>
<tbody>
<tr>
<td>The programme can be successfully completed within the set time, as certain programme-related factors that may be an impediment to study progress are removed as much as possible.</td>
</tr>
</tbody>
</table>

An even distribution of the study load was aimed for when the IDE Master’s curricula were developed. Hourly schedules facilitated the alignment and distribution of courses and projects on a weekly basis.
The proactive annual check by the ESAD Department of the hourly schedules as part of the study guide update was last done for the academic year 2005/2006 and was stopped with the introduction of the TU Delft-wide digital study prospectus. The Faculty will raise this issue in order to re-implement this check for the academic year 2007/2008.

The Faculty checks the study load distribution reactively in two ways, i.e. through course evaluations and time-keeping surveys, both part of the Internal Quality Assurance (IQA) system of the Faculty.

Students generally experience the IDE Master’s programmes as demanding. The course evaluation shows that students in general find the actual study load consistent with the planned study load. Looking at the course pass rates, there appear to be no permanent obstacles in the SPD Master’s programme.

Despite all proactive and reactive measures in relation to the study load, the average time for students to complete the Bachelor’s and Master’s programmes exceeds the nominal time, which is in many cases the personal choice of the individual student.

The score for this Facet is ‘Sufficient’.

F8: Intake

The structure and contents of the programme are in line with the qualifications of the students that embark on the degree course:

- Bachelor’s degree at a University (WO): VWO (pre-university education), propaedeutic certificate from a University of Professional Education (HBO) or similar qualifications, as demonstrated in the admission process.
- Master’s degree at a University (WO): bachelor’s degree and possibly selection (on contents of the subject).

The majority of the intake in the TU Delft IDE SPD Master’s programme consists of students who recently completed their IDE Bachelor’s programme at TU Delft. They have unconditional access together with IDE Bachelor’s graduates from UT and TU/e. BSc university graduates from Dutch degree programmes other than IDE have various options: unconditional transfer, transfer with a number of requirements, transfer with a bridging course, or no transfer possible.

Bachelor’s graduates in IDE and allied programmes of Dutch polytechnics and other students who have been admitted to the bridging course and have successfully completed it are admitted to the IDE Master’s programme as well. In September 2007 a pilot started involving a TU Delft IDE bridging course in the minor profile of the university of professional education (hbo) degree programme.

IDE Bachelor’s graduates from outside the Netherlands are admitted on the basis of the outcome of a selection (including both grades) and programme review process in which the most important criterion is that they must be able to obtain a degree within two years. The latter rules out full bridging courses, but a number of prescribed courses may be required.

The intake numbers of foreign students are increasing. Requests for admission to a Master’s programme continue to be assessed on an individual basis.
A dilemma still surrounds the requirement that once a Bachelor’s student from the TU Delft IDE Bachelor’s programme has obtained 150 EC (first and second year and half of the third year), he/she is admitted to IDE Master’s courses. The Executive Board is considering implementing, by 2010, the so-called ‘hard cut’ in which a Bachelor’s student must have obtained all the credits of the Bachelor’s programme (180 EC) before he/she is admitted to a Master’s programme. This is the normal requirement for transfer and foreign students. The implementation of a clear separation between the entrance to the Master’s programme and the Bachelor’s graduation will be accompanied by a double challenge: 1) to prevent further study delay and 2) to stop Bachelor’s graduates dropping out before moving to the Master’s programme, for example because they accepted a job while waiting to complete their Bachelor’s programme. On the other hand, it will create equal conditions in comparison with students coming from other Dutch and foreign universities and enable and encourage students to consider mobility after the Bachelor’s phase.

Information about the SPD Master’s programme is available in brochures and on the web. To become familiar with the Master’s programme, potential students can attend the spring and autumn information days. In addition, Master’s lunches for Bachelor’s transfer students and professional education students are held. Finally, one-to-one talks with a study advisor are offered to inform potential students about the programme and career prospects.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F9: Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>The degree course complies with formal requirements regarding the size of the curriculum:</td>
</tr>
<tr>
<td>• Bachelor of a University (WO): 180 credits as a rule.</td>
</tr>
<tr>
<td>• Master of a University (WO): a minimum of 60 credits, dependent on the relevant degree course.</td>
</tr>
</tbody>
</table>

The Master’s curriculum has a study load of 120 EC and a nominal study duration of two years.

The curriculum size of the Master’s programme is in accordance with the European Credit Transfer System (ECTS).

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F10: Coordination of structure and contents of the degree course</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The didactic concepts are in line with the aims and objectives.</td>
</tr>
<tr>
<td>• The teaching methods correspond to the didactic concept.</td>
</tr>
</tbody>
</table>

The teaching of knowledge and insight runs largely synchronous with their application. This didactic concept was adopted for all three IDE Master’s programmes, consistent with the didactic concept of the Bachelor’s programme: “learning to apply and integrate knowledge and skills in various situations, a mix of teaching formats and continued development of independence and self-reliance on the part of the student”. In that concept, the design projects are an underlying theme throughout the curriculum. The same project-based form of design education as for the Bachelor’s programme is used in the IDE Master’s programmes.
An important factor in the formulation of the Master’s programmes has been the fact that various intake groups had to be considered.

Two-thirds of the study load of the first year are devoted to practicals, assignments and projects. Self-study and lectures make up the rest of the study load. The second half of the second year is entirely devoted to the graduation project.

The semester evaluations have shown that the students, in general, appreciate the structure of the Master’s programme: courses and projects running in parallel and a mix of teaching formats in the first year. Some of the students interviewed still have the perception that group assignments and projects are conducted at the expense of individual development.

The score for this Facet is ‘Sufficient’.

### F11: Assessments and examinations

The system of assessments and examinations provides an effective indication whether the students have reached the learning targets of the course programme or its components.

The IDE Faculty uses several examination and assessment methods in line with the objectives of the course concerned. The examination and assessment methods for each course, assignment and project are defined and documented in the Study Guide. In general, knowledge-based objectives are tested in a written examination. Courses with an emphasis on skills utilize practical training results or the presentation of a student portfolio as the examination method. The portfolio-related examinations generally involve a discussion between the assessor and the student in which the marks awarded are substantiated. The assessment of group projects and group assignments is based on the results of the group and on an individual assessment.

The examination regulations are formulated by the Board of Examiners (BoE). The opinion of the Teaching Committee and the Faculty Student Council are solicited, after which the examination regulations are adopted by the Dean of the Faculty.

The regulations include a clause on the right of students to inspect their examination results. This right is exercised and leads sporadically to a formal protest (less than once a year for the Bachelor’s and Master’s programmes together).

The score for this Facet is ‘Good’.

The overall score for Topic 2 is ‘Sufficient’.
2.6.3. Deployment of staff (Topic 3)

F12: Requirements for University
The degree course meets the following criteria for the deployment of staff for a degree course at a University (WO):
Teaching is largely provided by researchers who contribute to the development of the subject area.

The teaching in the IDE Faculty is provided by academic staff (full, associate and assistant professors 60% of whom have a PhD) and lecturers (usually employed part-time in the Faculty alongside employment in the professional practice). The policy of the IDE Faculty is that as many staff as possible should combine teaching and research. The proportion doing so was 65% in September 2006. This approach ensures that the teaching is nourished by researchers, all together realising a relatively high publication rate. A strong research programme is in place, the quality of which was recognised by the last research visit and by the annual Research Advisory Board meeting.

From their first year onwards students come into contact with professors and PhD staff with lecturing duties.

The recruitment of part-time staff is a deliberate strategy to involve practising professionals and leading designers in the IDE Master’s programmes.

The score for this Facet is ‘Good’.

F13: Quantity of staff
The staff levels are sufficient to ensure that the course is provided to the required standards.

The figures presented in this section apply to the combined staff of the Bachelor’s and Master’s programmes. Currently, a total of 63.7 fte of IDE staff is available for education from a total of 154.74 fte. When the staff from other faculties teaching in the IDE programmes is counted as well, 68 fte are available for education. These numbers illustrate the target for academic staff that the time distribution for education, research and overhead should approximately equal 40/40/20%.

Currently, the student to staff ratio for IDE amounts to 25.5 (average 27 over the last three years) including the external fte from other faculties.

The average student to staff ratio of 27 is slightly lower than that of the IDE Faculty of UT (29.9) and favourable compared with e.g. Erasmus University and Tilburg University.

It was confirmed by the teachers that some vacancies were open too long.

The score for this Facet is ‘Sufficient’.

F14: Quality of staff
The staff is sufficiently qualified to ensure that the aims regards contents, didactics and organization of the course programme are achieved.

Around 60% of the teaching staff (full, associate and assistant professors) have a PhD. Teachers of the Master’s programme reported a lack of teachers combining a PhD degree with design experience.
The composition of the lecturing team is broad, and the range of expertise available suffices to handle the contents of the Master’s programme.

The IDE Faculty applies a procedure according to which educational performance is part of the annual staff performance review (R&O cycle). The intention is to give the evaluation results a formal place in the R&O cycle. A university job classification exercise was started in 2004 in support of the procedure.

Newly appointed teaching staff and those already appointed in 2003, 2004 and 2005 have to attend the TU Delft ‘Basic Teaching Qualification’ course. A variety of circumstances, the reorganization of the Education and Student Affairs Department (ESAD) and particularly within the Personnel Department, has limited the progress of this plan. A project leader to promote these activities was appointed in May 2006, and agreements have been made for 6 persons a year (two from each department of the Faculty) to attend the course.

The students interviewed expressed that they experience the academic staff as skilled and research-oriented. Some students expressed the wish to see more teachers - inspiring role models - from the professional world involved in the teaching process.

Although the faculty is aiming at an increase of the numbers of teaching staff, a delay in the didactic training of existing teachers was observed.

The score for this Facet is ‘Good’.

The overall score for Topic 3 is ‘Sufficient’.

2.6.4. Facilities and provisions (Topic 4)

The IDE Faculty now resides in a modern building with facilities adequately tailored to a design-oriented degree programme. The building contains student-oriented facilities like design studios, lecture theatres, computer rooms, freehand drawing rooms, the Model Making and Machine Shop, the Laboratory for Product Analysis, research and test rooms and the Industrial Design Engineering Library.

Some students expressed the opinion that the facilities do not offer enough room for private study, an observation that was confirmed by the teaching staff of the Master’s programmes. The Faculty is currently putting considerable effort into improving private study, graduation and laptop workplaces.

Through Blackboard, the TU Delft standard electronic learning environment, the students have access to 90% of the course-related information. The electronic learning environment also provides exercises and examinations and supports communication between lecturers and students.
ICT hardware is very much appreciated by the Master’s students. On the other hand, consensus existed about the lack of illustration/presentation software (for example ‘Illustrator’) and lectures teaching its use.

Lecturers of the SPD Master’s programme would in general like to see expansion of their ‘own’ SPD research facilities.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F16: Student support and guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The student support and guidance, as well as the information given to students are adequate for the purpose of students’ progress.</td>
</tr>
<tr>
<td>• The student support and guidance, as well as the information given to students meet the requirements of the students.</td>
</tr>
</tbody>
</table>

The student support and guidance system for Master’s students is aimed at adequate study progress, removing obstacles, improving study management, providing information and familiarising foreign and transfer students.

Under the heading of systematic counselling, several sessions are organised. An introductory session for all foreign and transfer students is arranged to cover a wide variety of practical information on studying IDE at TU Delft.

An introductory lecture is given on the first day of the new academic year to explain what students may and may not expect from the Master’s programme and vice versa.

A system of student mentors is in operation for international students (as is the case for the first-year Bachelor’s students). A senior student, under supervision of the international coordinator and the study advisor, arranges a socio-cultural programme for international students.

Students who perform marginally well or poor are invited for an interview with the Master Coordinator in the second semester.

Individual counselling is provided on request, to deal with a wide variety of subjects ranging from administrative and progress problems to career-related issues and socio-psychological and medical problems.

Further support is given through the course “Preparation for Graduation”, to assist the student in selecting and starting up the graduation project. Master’s students are supported in their preparation for the labour market through the course “Professional Design Practice”. Despite these efforts, some foreign students expressed the opinion that the web-based info about the IDE Master’s programmes needed improvement, e.g. with examples of projects. Moreover, they experienced a lack of support upon arrival and during the early phases of their study.

Blackboard, the electronic learning environment, provides students with on-line access to their registered examination results and grading. The Service Point information desk provides students with information about enrolment, timetable changes, events, lectures, etc.
The students consider the support and guidance procedures and systems adequate.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 4 is ‘Sufficient’.

2.6.5. Internal quality assurance (Topic 5)

<table>
<thead>
<tr>
<th>F17: Evaluation of results</th>
</tr>
</thead>
<tbody>
<tr>
<td>The degree course is subject to a periodic review, which is partly based on verifiable targets.</td>
</tr>
</tbody>
</table>

The Internal Quality Assurance System applied to the IDE programme is based on the concept of the TU Delft-wide developed quality assurance system. The system offers a definition of quality, i.e. the degree to which the objectives of the degree programme are realized, and the associated IDE Faculty quality standards. Furthermore, the system provides a set of quality monitoring instruments (for example, the SENSOR enquiries for course monitoring), a procedure for the follow-up of monitoring results, and a description of relevant organizational responsibilities. The system is applied to the IDE Bachelor’s and Master’s programmes.

Both the semester and each course are subject to evaluation. The semester evaluation is the highest evaluation level in the IDE IQA system. In addition, evaluations are carried out on the results of teaching, student time-keeping, facilities, complaint procedures and student exit interviews.

A professional self-assessment report, presenting an evaluation of and action plan for each facet and topic, is one of the products of the IQA system.

Criteria have been defined for the IDE Bachelor’s and Master’s graduates in terms of the final achievement levels of the degree.

Targets have been defined for the quantitative results of the Bachelor’s and Master’s education processes.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F18: Measures to effect improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>The results of this evaluation form the basis for measures that can be demonstrated to improve the course and that will contribute to reaching the targets.</td>
</tr>
</tbody>
</table>

The recommendations of the previous educational evaluation (VSNU report May 2002) have been followed up carefully. The Faculty has undertaken to resolve a sizable list of specific actions since the last visit, and the majority of the recommendations has been implemented. This resulted, for example, in the Faculty’s independence in 2004 and in the introduction of a new Bachelor’s programme that will be implemented in the academic year 2007/2008.
Following the successful implementation of the new Bachelor’s programme, the Faculty intends to review the Master’s education at the programme level in a similar way to that done for the Bachelor’s programme.

The Educational Advisor discusses the outcomes of the evaluations with the lecturer in question. A summary of the evaluation results, the person’s response and the agreed actions for improvement are documented and submitted to the Board of Education. Where evaluations show results below target, a follow-up survey is scheduled for the following year. The initiative for follow-up rests with the Educational Advisor, a delegated responsibility from the DoE. Reference is made to the list of improvement projects shown in the self-evaluation document, specifying the scope, responsible person and completion date.

Course evaluations have led to an introduction day for foreign students.

Consultations with the professional practice have led to more emphasis on Internationalisation, Branding and Economics.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F19: Involvement of staff, students, alumni and the professional field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff, students, alumni and the professional field in which graduates of the course are to be employed are actively involved in the internal quality assurance.</td>
</tr>
</tbody>
</table>

Teaching staff and students are actively involved in all phases of the quality assurance process. The full Board of Education approves the IQA activity plan developed by the Educational Advisor.

A strong network exists for student representation, consisting of the ID society, the OKIO, an active study association, and response groups.

The self-evaluation report was communicated with a focus group and, at a later date, with the Faculty Council, with the ID society and with several other stakeholder groups.

The professional field will become involved through the WO-monitor (alumni) as soon as sufficient SPD MSc graduates have found employment in the market. The Educational Advisory Committee represents and arranges further systematic involvement of the professional field.

The score for this Facet is ‘Good’.

The overall score for Topic 5 is ‘Sufficient’.
2.6.6. Results (Topic 6)

<table>
<thead>
<tr>
<th>F20: Level that has been achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications that have been achieved correspond to the targets set for the final qualifications in level, orientation and domain-specific requirements.</td>
</tr>
</tbody>
</table>

The Committee interviewed a selection of alumni who felt sufficiently equipped for their job in the professional practice, and the Committee saw a wide selection of graduation projects. The Committee specifically reviewed nine TU Delft Master’s theses as part of this evaluation. In all but two cases, the scores awarded by the Committee were in line with the scores awarded by the Faculty. In one of the two cases, the Committee score was higher, and in the other case, the Committee score was lower than the score awarded by the Faculty. The Committee is aware of the fact that their review of the selection of theses is only part of the full final assessment of the competencies achieved by a particular student. Based on the theses reviewed, the Committee is of the opinion that the MSc graduates have achieved the final qualifications. The use of the English language in the theses should be improved.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F21: Success rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>To measure the success rates, target figures have been set in comparison with relevant other degree courses. The success rates meet these targets.</td>
</tr>
</tbody>
</table>

The Faculty has set an explicit target figure for the Master’s student pass rate: 40% in two years. The 3TU Science and Technology plan sets an ultimate pass rate of 90% of the incoming Master’s students.

Insufficient figures are available since 2003 to assess whether the ultimate 3TU pass rate will be achieved. The 40% pass rate after 2 years has not been met after 2.5 years. Several reasons exist for the ‘below target’ pass rate. The first one is that many students start the Master’s programme when they still lacking 30 EC of the Bachelor’s programme. Next, some students opt to attend university courses abroad or chose an internship abroad (as an elective) in addition to the 120 EC Master’s programme. Sometimes students lose quite some time finding a foreign company for their graduation project. Finally, in many cases it is the student’s own choice to spend more than the nominal time to complete the Master’s programme.

Plans to improve the Master’s pass rates further have been identified by the Faculty and consist of completion of a time-keeping survey started in 2006, a studiability investigation for which a grant has been obtained, and the ‘hard cut’ policy to be introduced by the Executive Board in 2010, under which a student is allowed to start the Master’s programme only after the Bachelor’s programme is completed.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 6 is ‘Sufficient’.
3. The Industrial Design Department, TU/e

3.1. Introduction of the Department

The development of the new Industrial Design (ID) Department of TU/e is characterised by various aspects: the development of the Bachelor’s and Master’s programmes, the building of four research groups, the recruitment of researchers and teaching staff, starting research and the intake of students. The Bachelor’s programme started in 2001, and the first Master’s students started in 2005. The graduation of the first MSc students is imminent. Right from the start, the Department focussed on intelligent products, systems and services for the interaction of human beings with their environment. To receive feedback on the first phase of the development process, an international advisory committee was asked in 2003 to evaluate the development of the Department so far. Points for improvement resulting from the evaluation were implemented and used as input for the next phase of the development process. The focus on intelligent products, the integration of the fields of technology (with a focus on Electrical Engineering and Computer Sciences), users and design, as well as the international approach (evaluation by an international committee, composition of staff) characterise the new Department of Industrial Design of TU/e and, at the same time, constitute its mission.

3.2. General reflection of the Committee

The Department chose to build the Bachelor’s and Master’s programmes on the concept of competency-centered learning, experience-based learning, collaborative and individual learning, self-directed and continuous learning, and feedback and assessment. The Committee is impressed by the way the Department has implemented this new educational concept. The concept and the reasoning and rationale behind it, as well as the systems developed and implemented, are all part of a coherent framework and consistently applied in all aspects of the TU/e Bachelor’s programme. The aspects range from projects, assignments, and individual study time, modules and classes to assessment and examination. Some fine tuning is still needed for the Master’s programme. The resulting curricula provide a unique platform for students to develop industrial design competencies. However, it should be noted that not all students (in terms of character) will fit in the educational concept.

One of the choices has been to advance students to the next level on the basis of ‘promotion’, ‘conditional promotion’ or ‘hold’ verdicts rather than on the basis of a grading system. However, it is the opinion of the Committee that some form of a grading system should be adopted to satisfy the needs of the professional practice and institutes outside the Department. The ID engineer should be able to work in an international setting and profit from it. In particular, designing systems and products according to the TU/e model starts with the user and his/her cultural setting. As a result, for ID the intercultural and international aspects are not just a part of a general internationalization policy, but primarily a part of the design content itself. Both perspectives are incorporated in the internationalization policy that has been developed. However, internationalization is not part of the scope of this evaluation.
The ID educational concept is now starting to prove its worth by preparing students to be independent thinkers and designers with a clear orientation on intelligent systems, interfacing the user with his/her environment.

Teachers interviewed confirmed that the competency-centered educational model requires a substantial coaching effort. Besides, the time spent on administrative and procedural tasks (e.g. for the assessment) also take considerable time. Hence the Department should reflect on the sustainability of the educational concept in the case of substantial growth of ID student numbers, develop a growth strategy and monitor the developments carefully.

In the near future a stronger integration of research in the Bachelor’s and Master’s programmes should be pursued.

3.3. The assessment Protocol TU/e BSc ID

3.3.1. Objectives of the degree courses (Topic 1)

<table>
<thead>
<tr>
<th>F1: Domain-specific requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications of the degree course correspond to the requirements made to a degree course in the relevant domain (field of study/discipline and/or professional practice) by colleagues in the Netherlands and abroad and the professional practice.</td>
</tr>
</tbody>
</table>

The Department of Industrial Design (ID) started in 2001 and is still in its development phase. Many aspects of such a new department are developed at the same time; the new definition of the contents of ID, the programmes, the educational model, staff, research, facilities, and the international network. In the course of time a new discipline, ruling the field of ID, is to be developed by integrating the three paradigms: Engineering, Science and Design. The vision of this integration for ID forms the basis for a great opportunity to contribute to the development of the trans-discipline ID.

Right from the start in 2001, the Department decided to focus on intelligent products, systems, and services. The new industrial design engineer educated at the Eindhoven University of Technology (TU/e) should be able to integrate four important fields of knowledge: Design, User, Technology, and Business. The development of competencies rather than the acquiring of knowledge is considered paramount in the competency-centered learning model that has been adopted for the ID Bachelor’s and Master’s programmes. Needless to say, the emphasis is on the development of the student rather than on the development of products.

A large part of the Bachelor’s programme takes place in what is called the domains: Play, Health, Home, and Work.

In the Education and Examination Regulations the aim of the Bachelor’s programme is stated:

“A TU/e ID Bachelor’s graduate has received an academic education, has developed a broad scientific orientation in the area of industrial design engineering, is prepared for further studies with at least entrance to the TU/e Master’s programme of Industrial Design.”

The BSc graduate is competent in a wide field of industrial design engineering as expressed by the competency framework that underlies the programme.
The competency framework consists of six core competencies, reflecting the domain of ID, and four meta-competencies, fundamental to the academic level of the ID graduate. The core competency areas are: Ideas & Concepts, Integrating Technology, User Focus & Perspective, Socio-cultural Awareness, Market Orientation, and Form & Senses. The meta-competency areas are: Multidisciplinary Teamwork & Communication, Design & Research Processes, Self-directed & Continuous Learning, and Analysing Complexity. The competencies can be seen as the final qualifications of the degree course.

The IDE programmes (within the Delft University of Technology, Eindhoven University of Technology and University of Twente) have laid down the competencies and labour market positions of IDE graduates and the distinction between Bachelor’s and Master’s levels in a common domain-specific reference frame (DSRK).

The TU/e ID Department is in contact with many institutions within and outside the Netherlands, for example, Georgia Tech Atlanta in the USA. The Woodruff School of Mechanical Engineering at Georgia Tech Savannah plans to build, in cooperation with the TU/e ID Department, a programme based on the same principles as the TU/e ID programme. In addition, the Faculty of Industrial Design Engineering of TU Delft has consulted the TU/e ID Department to explore ideas about the introduction of competency-centered learning in their new Bachelor’s programme.

The Department has established an international Advisory Board, composed of experts in different ID-related fields from all over the world. The Advisory Board meets with the ID Department Board twice a year to discuss developments in the ID field.

The score for this Facet is ‘Sufficient’.

The competency framework of ID is the description of the competencies (final qualifications) that are needed to become a graduated BSc and MSc IDE engineer. The competency framework has been related to the so-called Dublin Descriptors and their further detailing in the *Criteria for Academic Bachelor’s and Master’s Curricula*. These criteria are formally accepted by NVAO as a more expanded and relevant statement of the Dublin Descriptors which must be respected as required by the QANU protocol. By having developed and implemented these criteria, the three Dutch universities of technology stand out positively from other universities in the Netherlands.

The criteria describe, in detail, the distinction in level between academic Bachelor’s and Master’s degrees, and also the range of intellectual attributes and understanding of contexts that a trained engineer may require, depending on career direction. Therefore, these criteria are more suitable for a specific qualitative examination of the Bachelor’s and Master’s programmes concerned than the Dublin Descriptors.
As the formulation of the TU/e ID Bachelor’s and Master’s programmes achievement levels complies with the *Criteria for Academic Bachelor’s and Master’s Curricula*, compliance with the Dublin Descriptors is assured.

The difference between Bachelor’s and Master’s competencies is based on the increasing level of complexity and abstraction and the level of independence that is required of the students dealing with them.

Based on the analysis performed by the Faculty and the verification carried out by the Committee, it can be concluded that the final qualifications of the degree courses meet the requirements laid down in the Dublin Descriptors.

The score for this Facet is ‘Good’.

### F3: Orientation

The final qualifications of the degree course correspond to the following descriptions of a Bachelor and a Master at universities:

- The final qualifications are based on requirements made by the academic discipline, the international academic practice and, if applicable to the course, the relevant practice in the prospective professional field.
- A University (WO) bachelor possesses the qualifications that allow access to a minimum of one further University (WO) degree course at master’s level as well as the option to enter the labour market.
- A University (WO) master possesses the qualifications to conduct independent academic research or to solve multidisciplinary and interdisciplinary questions in a professional practice for which a University (WO) degree is required or useful.

The final qualifications are described in a competency framework that matches the requirements of the national academic discipline, the international academic practice and the prospective professional field as described under Facets 1 and 2 above.

The ID Bachelor’s degree gives unconditional access to the appropriate Master’s programmes of the three technical universities (3TU) in the Netherlands and to four other Master’s programmes at the 3TU. Moreover, ID BSc graduates have access to 18 other engineering Master’s programmes of the 3TU for which a specific minor of 30 EC is required. They also have access to international Master’s programmes (e.g. the Royal College of Arts, UK).

The admission criteria are regulated in a 3TU admission matrix. Also, entrance to the labour market is a possibility, as some ID BSc graduates have demonstrated.

The objectives (competencies) are in line with the national/international academic, domain-specific and professional requirements. The latter are assured by the set-up and operation of the Advisory Board. The Department has planned to further specify the Bachelor’s and Master’s levels in terms of the final qualifications and to conduct an international benchmark to verify compliance with the requirements specified above.

The score for this Facet is ‘Sufficient’.

**The overall score for Topic 1 is ‘Sufficient’**.
3.3.2. Programme (Topic 2)

F4: Requirements for university degree courses
The programme meets the following criteria applicable to a degree programme at a University (WO):
• The students acquire knowledge on the interface between teaching and academic research within the relevant disciplines;
• The programme follows the developments in the relevant academic discipline(s), as it is demonstrated that it incorporates current academic theories;
• The programme ensures the development of skills in the field of academic research;
• For those courses for which this is applicable, the course programme has clear links with the current professional practice in the relevant professions.

At the time of the evaluation, three research groups were active: ‘Designed Intelligence’, ‘User Centred Engineering’, and ‘Designing Quality in Interaction’. A fourth research group ‘Business Process Design’ started in April 2007. These research groups provide the knowledge base for the Bachelor’s and Master’s programmes and drive the development of the knowledge needed for the design of intelligent systems, products, and related services as well as for the development of the new trans-discipline of ID. The research staff is involved in educational activities 50% of the time.

When a student is developing a particular competency, s/he needs to acquire and use new knowledge, skills and attitudes in a specific context. At the ID Department such a context is always related to designing in one of the four domains: Play, Health, Home, and Work. Becoming an ID Bachelor requires competency development in all ten competency areas described under Facet 1. This implies that the focus in programme development is on learning activities. Learning activities, like projects, assignments and individual learning, offer the student the opportunity to acquire new knowledge, skills and attitudes.

Each year of the Bachelor’s programme is divided into two blocks. The semesters of the first two years are reserved for projects, assignments and individual learning time. The first semester of the third year is reserved for an internship and individual learning and the second semester for the Individual Bachelor Project (IBP). In the typical semester, the ID Bachelor’s student is engaged in both project and assignments (and individual learning) which involve team as well as individual work.

Each competency area in the Bachelor’s programme (except for ‘Market Orientation’) is the responsibility of a professor who provides the assignments, the link with the academic discipline and the incorporation of current academic theories. The professor ‘adopting’ the competency area ‘Market Orientation’ still had to be appointed at the time of the evaluation. Professors from other faculties (for example, Electrical Engineering) are involved as assignors. Professionals from outside (for example, designers, architects and staff members from partners like Philips or TNO) are often involved in education as real-life clients in the development and execution of projects, or as assignors.

The projects are generated by the domain core teams. These teams consist of staff from the professional field and of researchers integrating their research activities with projects. The majority of the projects are linked to the professional field and a substantial part to research. All full professors are also associated with a particular domain.

The score for this Facet is ‘Sufficient’.
The ID Bachelor’s programme is different from many other academic programmes as ID does not have a fixed curriculum with one learning route for all students. However, the students follow a programme in which the number and type of learning activities in the various blocks are carefully defined. Any deviation must be approved by the Board of Examiners (BoE).

The goal of the Bachelor’s programme is for all students to achieve at least a minimum level in all competency areas. The students are ‘junior employees’, challenged to develop their competencies and coached by the ‘senior employees’, staff from both research and the professional field.

The Department ensures that the minimum competency levels are achieved by offering assignments and a mix of individual and group projects related to all ten competency areas of the framework: Ideas & Concepts, Integrating Technology, User Focus & Perspective, Sociocultural Awareness, Market Orientation, Form and Senses, Multi-disciplinary Teamwork & Communication, Design & Research Processes, Self-directed & Continuous Learning, and Analysing Complexity.

The achievement of the minimum competency levels is facilitated by the execution of projects that promote the students’ competency development in the different areas. In the Bachelor’s programme the assessment feedback and the feedback from his/her competency coach form the basis for the selection of assignments needed for the achievement of the final qualifications (competencies).

All assignments and projects have learning goals – and sometimes prerequisite levels – described. It is the opinion of the Committee that the assignments and projects contents are adequate to achieve the learning goals described. By mapping these assignments and projects against the ten competency areas, the Department has demonstrated that the final qualifications are achieved by completing the Bachelor’s programme.

Professors are directly responsible for the contents of the assignments. The researchers, including the professors, and external professional staff contribute to the content of the projects. The students interviewed confirmed that they obtained sufficient basic fundamental knowledge of Mathematics (meta-competency area D) and Mechanics and Materials (competency area 2) through the assignments for these areas. Continuous monitoring will be required to ensure that the fundamentals of Engineering Science, for example Control and Dynamics, are adequately taught.

A compulsory minor is not yet part of the Bachelor’s curriculum. The Department proposes transforming the already existing internship into a possible minor, as the internship is very important for the student’s competency development.

The score for this Facet is ‘Good’.
Coherence in the Bachelor’s programme is provided through the annual themes and the design process. The students interviewed confirmed that they study a programme that is challenging and in which the prerequisites of the next step are carefully taken into account in the planning of assignments and projects.

The first year has the central theme of ‘awareness and selection’ during which a basic level of competency is covered and the Department obtains a clear picture about the potential of the student to become a design engineer. The second year is aimed at the development of depth. Along with more complex and longer projects, each block ends with so-called ‘individual learning time’.

The third year focuses on identity building and further deepening of competencies. The other aspect of coherence is that the Bachelor’s students go through the design cycle each year as part of their projects.

Next to the concept of competency-centered learning, the concept of experience-based learning underlies the educational model of the TU/e ID programme. A generally recognised strength of this concept is its coherence; the students start designing from their first day onwards. In this way they experience the need to develop specific competencies and learn to evaluate their usefulness.

A fixed sequence of 1) internship and 2) the IBP has been adopted for the third year. In that way students can use their internship experience as preparation for their IBP.

The score for this Facet is ‘Good’.

It is the opinion of the Committee that the study load is spread evenly over the programme: 30 EC per semester, on the basis of 40 hours per week. Evaluation results show that 89% of the students indicate that the study load of assignments and projects is reasonably well divided over the periods. On average, students spend considerably more weeks (18) on the internship and on the IBP than the planned 12 weeks. Sometimes this is caused by the students if they are eager to stay longer (internship) or extend the scope of their IBP. A further analysis of the study load of the IBP is needed, however.

The score for this Facet is ‘Sufficient’.
F8: Intake
The structure and contents of the programme are in line with the qualifications of the students that embark on the degree course:

- Bachelor's degree at a University (WO): VWO (pre-university education), propaedeutic certificate from a University of Professional Education (HBO) or similar qualifications, as demonstrated in the admission process.
- Master's degree at a University (WO): bachelor's degree and possibly selection (on contents of the subject).

The intake in the Bachelor's programme consists almost exclusively of students who recently completed their secondary school education (vwo), with profiles Maths and Physics (N+T) and Health and Physics (N+G). Also, students with a propaedeutic diploma from a related programme of a university of professional education (hbo), such as Mechanical Engineering, Electrical Engineering or Industrial Product Design, can start the ID Bachelor's programme.

Foreign students must have a diploma equivalent to vwo (N+T) or (N+G). Compliance is assessed by the central TU/e administration. An additional requirement is proficiency in English.

Information about the Bachelor's programme is available in the information guide on the web and via various fairs, for example, the annual Bachelor's fair in Utrecht, visits and information days. It is thereby of major importance that potential students are properly informed about the technical character of the study programme.

Every year the TU/e organises several 'information days' for vwo classes 5 and 6. Interested students are invited to visit the Department during a monthly 'participation day'. Further information is provided in numerous one-to-one contacts with high schools in the Netherlands.

A quick scan evaluation, executed by the central TU/e administration, revealed that first-year students state that the link between their secondary education and the contents of the ID programme was 'reasonable to good' and that the link for the subjects of Mathematics and Physics was 'reasonable to good' as well.

Not every student has the personal characteristics needed to fit the competency-centered learning model of the TU/e ID programme. Such students could be better off in one of the other ID programmes of 3TU.

The Committee concludes that the contents of the ID Bachelor's programme of TU/e are in line with the qualifications of the students who embark on the degree course and that the information given in the 'recruitment phase' provides a realistic picture of what to expect from the programme.

The score for this Facet is ‘Sufficient’.

F9: Duration
The degree course complies with formal requirements regarding the size of the curriculum:

- Bachelor of a University (WO): 180 credits as a rule.
- Master of a University (WO): a minimum of 60 credits, dependent on the relevant degree course.

The Bachelor's curriculum has a study load of 180 European Credits (one EC nominally corresponds to 28 hours of study) and a nominal study duration of three years.
The curriculum size of the Bachelor’s programme is in accordance with the European Credit Transfer System (ECTS).

The score for this Facet is ‘Sufficient’.

F10: Coordination of structure and contents of the degree course

- The didactic concepts are in line with the aims and objectives.
- The teaching methods correspond to the didactic concept.

Five years after the start of the ID Bachelor’s programme, the Department has developed the core of a truly competency-centered educational model.

The model is based on the vision that designing is a profession that is experience-based by nature. The design engineering competencies are learned and formed in a cycle that begins with the actual design experience in a project, followed by knowledge acquisition in assignments and individual learning time. The competency-centered educational model and ‘self-driven development’ stand for the student’s future professional environment.

The Committee is impressed by the extent to which the educational model and the related different ways of learning (competency-centered, experience-based, collaborative and individual, and self-directed and continuous learning) have been implemented in the Bachelor’s curriculum and associated fields like assessment and examinations.

In a typical semester Bachelor’s students are engaged in a project 60% of the time and in two assignments 40% of the time. The projects and assignments are learning activities that provide the student with collaborative and individual learning. Some 40% of the students do an internship or foreign exchange programme abroad in the third year. The students write an internship or foreign exchange plan that, in turn, is evaluated by the Bachelor’s internship coordinator.

During the internship students have a coach in the internship organisation and a departmental coach from one of the four domains. A fixed sequence of internship first followed by the IBP has been adopted for the third year. In that way students can use their internship experience as preparation for their IBP.

The score for this Facet is ‘Good’.

F11: Assessments and examinations

The system of assessments and examinations provides an effective indication whether the students have reached the learning targets of the course programme or its components.

The ID Department has implemented an assessment system that fits the principles of a competency-centered educational model.

The Bachelor’s assessment system is portfolio-based in essence. The portfolio consists of the student’s self-evaluation (SE) substantiated by learning evidence and feedback from assignors, project coach, client and competency coach. Based on the SE and the assessment feedback, the student defines the learning goals for the next semester and discusses them with his/her competency coach.
The actual assessment is a two-step procedure in which an independent assessor first evaluates the competency development and formulates an assessment conclusion in terms of a ‘Promotion’ (P), ‘Hold’ (H), or ‘Conditional promotion’ (C) verdict. Second, the assessor presents his tentative verdict and justification to the assessor meeting where the core team members of the annual group and the competency coaches are present. One objective of the meeting is to verify the verdict and justification, and the other objective is to ensure consistency in the assessment verdicts. At the end of the Bachelor’s programme, the students prepare a special SE about their Bachelor’s competency development. They present a showcase portfolio to a three-member assessment panel and have an in-depth discussion.

The Hold verdict is severe, in the sense that a Bachelor’s student has to redo an entire block, selecting different assignments and doing a new project.

Every semester, the assessment is evaluated, and the results are discussed with the Education Committee (EC), programme managers and the Board of Examiners (BoE).

The BoE approves the procedure developed and the standards set by the Director of Education, who in turn consults the EC about the procedure and standards adopted. Every year a training course is organized to familiarize new staff with the assessment procedure. The list of assessors is approved annually by the BoE. The BoE also monitors the proper implementation of the assessment procedure. Students can submit an appeal with the BoE if they do not agree with an assessment. In some 5% of the cases an appeal is submitted, of which 20% is granted (this is about 1% of all assessments carried out).

Students and lecturers were unanimous in saying that some need for grading has been identified, in addition to the system of verdicts, for example, because foreign universities and institutes often ask for a grading.

The Faculty does see the need of giving a distinction to the top 5-10% of the students (cum laude), as this is often asked when students want to go abroad (either for exchange or a Master’s programme).

The Committee is convinced of the carefulness and effectiveness of the assessment procedure developed for the competency-centered learning model, but has some doubt about its efficiency. The procedure, in which the students receive written feedback at all stages of their learning activities, is certainly time-consuming. The Committee is concerned about whether this assessment procedure is sustainable given growing student numbers.

The score for this Facet is ‘Good’.

The overall score for Topic 2 is ‘Sufficient’.
3.3.3. Deployment of staff (Topic 3)

**F12: Requirements for University**
The degree course meets the following criteria for the deployment of staff for a degree course at a University (WO):
Teaching is largely provided by researchers who contribute to the development of the subject area.

As a rule the scientific staff spend 50% of their time on research and 50% on educational tasks, including overhead, with the exception of PhD students for whom the figures are 80% and 20%, respectively.

The target is that 75% of the teaching tasks will be done by permanent staff and 25% by staff from other TU/e departments and by the professional field. At the time of evaluation these percentages were 58% and 42%.

From their first year onwards, students come into contact with academic role models.

All full and associate professors have a PhD, as have 70% of the assistant professors.

The link with the professional practice is made in projects where external designers contribute to the development of projects and act as an ‘external coach’ providing feedback for the SE. The link is also made in specialist courses by guest lecturers from design firms and industrial companies.

The score for this Facet is 'Sufficient'.

**F13: Quantity of staff**
The staff levels are sufficient to ensure that the course is provided to the required standards.

Currently, 17 fte of ID staff are available for education from a total of 44 fte. When the staff from other faculties and external staff teaching in the ID programmes is counted as well, 35.4 fte is available.

Lecturers interviewed highlighted that a competency-centered educational model means that approximately 80% of the educational tasks (from the 35.4 fte) consists of coaching, the expert role, lecturer of assignments, modules and classes, and giving feedback, whereas 20% is spent on administrative or procedural tasks, and meetings.

Currently, the student to staff ratio for ID amounts to 12, when including the external fte and fte from other faculties. Comparable ratios at UT and TU Delft vary between 27 and 29. The Department expects the ratio to increase to approximately 20.

The matching of growing student numbers with the ‘labour-intensive’ educational model chosen will become a great challenge for the Department when the student to staff ratio approaches 20. The creative use of ICT by developing e.g. web-based self-study assignments may help to alleviate the situation, although the significant impact of the coaching tasks will remain.

The score for this Facet is ‘Good’. 
F14: Quality of staff
The staff is sufficiently qualified to ensure that the aims regards contents, didactics and organization of the course programme are achieved.

The motto of the personnel policy of both TU/e and the ID Department is “Excellent people attract excellent students”.

When attracting new scientific staff, the ID Department uses the selection procedure and criteria for scientific staff formulated at the TU/e level augmented with ID-specific selection criteria. The professional development of PhD students and young assistant professors is stimulated by specific training programmes. In addition, the ID Department offers various courses to support academic leadership like ‘the quality of education’, ‘management of competency development’ and ‘the English language’. Furthermore, all new teaching staff have to follow a compulsory introduction programme about the educational model and the roles of the core team members, as well as didactical courses like ‘teaching and learning in higher education’.

All full and associate professors hold a PhD, as do 70% of the assistant professors. Four assistant professors are actively working on their PhD.
In the evaluation of the assignments, Bachelor’s students confirm that they regard their assignors to be experts in their field.
A review of the teaching staff and their field of expertise confirms that the expertise and background of the teaching staff cover the areas of the competency framework.

The teachers are well prepared for their teaching duties, with respect to both their field of expertise and the required skills of coaching and lecturing. The lecturing staff is trained for their coaching role in a one-day coaching workshop. Moreover, a buddy system has been introduced to provide peer support for the coaches. Monthly inter-vision meetings are conducted for all the lecturers to mutually reflect on their coaching activities.

In 2005 an annual cycle of ‘performance and personal development interviews’ started.

The score for this Facet is ‘Good’.

The overall score for Topic 3 is ‘Sufficient’.

3.3.4. Facilities and provisions (Topic 4)

F15: Material facilities
The accommodation and material facilities are sufficient to implement the programme.

The accommodation of the domains is in need of some renovation at least to a facility which is tailored to a design degree programme. In this context the remark was made that the Department is planning to build new ID premises.

The ID Department participates in the TU/e notebook project, which means that each first-year student can buy a laptop and software under attractive conditions. For tasks that need more powerful or dedicated software and hardware, students can use a variety of dedicated up-to-date facilities such as high-end PCs located on the Department premises. A service desk
is in operation to support staff and students for queries concerning hardware and software and audiovisual attributes. Wireless access to the Internet is available in most zones within the Department.

Through the IDportal the students have access to electronic documentation, e.g. their personal portfolio.

A review of the information on the IDportal in 2006 indicated that there was room for improvement. A project has been started to focus on improving the IDportal as a document management system and is expected to be completed at the end of 2007. At the same time TU/e is working on a user-friendly portal for students and staff that gives access to all educationally related databases, including Studyweb and the Department’s IDportal document management system. (Studyweb is a type of course management tool already in use by other TU/e departments. It provides a framework for the current and future communication needs of the TU/e departments. Studyweb is embedded in OWIS, the student progress administration and reporting system.)

The material facilities are considered adequate by the students. Some of the students interviewed requested longer opening hours.

The score for this Facet is ‘Sufficient’.

All TU/e departments use the central OWIS system for the registration of study progress. The students are automatically notified by email when new examination results have been added. Descriptions of assignments and projects can be found on OWIS.

In the educational model adopted, students have two types of coaches: the project coach and the competency coach. The project coach is responsible for the coaching of the project team about their project and has, as a rule, weekly meetings with the project team to discuss progress. The project coach also coaches and gives feedback on the group process. The competency coach is responsible for coaching the individual student with respect to his/her competency development. For this purpose the competency coach has, on average, bi-weekly meetings with the student to give feedback and discuss development plans and/or learning goals. The coach can also refer a student to the study advisor. The benefit of the system is that students who make insufficient progress and/or lack motivation are quickly spotted by one of the coaches.

The study advisor invites students pro-actively for a meeting to discuss the cause of a lack of progress. Students in turn can schedule an appointment with the study advisor at any time to discuss ID and programme-related issues or personal problems. Coaches and study advisors can refer students to the Education and Student Service Centre for specialist services. Bachelor’s students indicated in the general questionnaire 2005/2006 that they are very satisfied with the work of the study advisors.
The score for this Facet is ‘Good’.

The overall score for Topic 4 is ‘Sufficient’.

3.3.5. Internal quality assurance (Topic 5)

F17: Evaluation of results
The degree course is subject to a periodic review, which is partly based on verifiable targets.

The Internal Quality Assurance System offers a structured approach for the monitoring and review of the various topics identified by the NVAO accreditation system. Since February 2005, the system has been developed in a systematic way. The IQA activities initiated by the system are driven by an annual plan. The system is valid for both the Bachelor’s and the Master’s programmes. Priority has been given to the evaluation of the educational activities.

Currently, the systematic evaluation and reporting at the assignment, project and semester levels have been implemented. Furthermore, the internship and the IBP are evaluated by default.

The further implementation of the IQA system at the Bachelor’s and Master’s programme level is in progress. Although not formally part of the IQA system, the Bachelor Advisory Group (BAG) was installed in April 2007 for a period of one year to review the implementation and operation of the Bachelor’s programme. Their task is to review the actual state of implementation compared with the plan and to improve the coherence between the assignment and the project as well as between the project on the one hand and the competencies on the other.

A professional SE report, presenting a clear summary of strengths and weaknesses and future actions for each topic, is one of the products of the IQA system.

Targets have been defined for the quantitative results of the Bachelor’s educational process.

The score for this Facet is ‘Sufficient’.

F18: Measures to effect improvement
The results of this evaluation form the basis for measures that can be demonstrated to improve the course and that will contribute to reaching the targets.

As 2005/2006 was the first year in which assignments and projects were systematically evaluated, no completed ‘plan-do-analyse-improve’ cycle could be presented. Examples of ‘plan-do-analyse-improve’ cycles were presented on other topics like the assessment organization and the IBP.

The evaluation results are discussed with the responsible staff, and measures for improvement (follow-up) are implemented the next time an assignment (or module or project) is done.

As a rule, the results of follow-up of recommendations will be formally discussed the next time the activity concerned is evaluated. At this stage a formal follow-up process is not deemed necessary by the Faculty.
The score for this Facet is ‘Sufficient’.

<table>
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<tr>
<th>F19: Involvement of staff, students, alumni and the professional field</th>
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<tbody>
<tr>
<td>Staff, students, alumni and the professional field in which graduates of the course are to be employed are actively involved in the internal quality assurance.</td>
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</tbody>
</table>

Teaching staff and students are actively involved in all phases of the quality assurance process. Reference is made to the Bachelor Advisory Group (BAG) mentioned under Facet 17. In this context the Committee notes that the BAG could also be asked to reflect on the fundamentals an academic design engineer should know.

A strong student network exists that supports the review and feedback of students in relation to the Bachelor’s and Master’s programmes; for example, in addition to the student representation on the Education Committee (EC), the Faculty Council (FSR) and an active study association (Lucid), ‘Jaarraden’ and ‘Koepeloverleg’ exist in which students are active.

The Department aims at paying special attention to the involvement of alumni, as this group is now slowly growing, and of the professional field, as they are only involved in IQA through the internship evaluation.

The EC discusses the planning of IQA activities, the evaluation of the results and the recommendations for improvement.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 5 is ‘Sufficient’.

3.3.6. Results (Topic 6)

<table>
<thead>
<tr>
<th>F20: Level that has been achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications that have been achieved correspond to the targets set for the final qualifications in level, orientation and domain-specific requirements.</td>
</tr>
</tbody>
</table>

The Committee reviewed eight Bachelor’s theses as part of this evaluation. In five cases the scores awarded by the Committee were in line with the scores awarded by the Department. In one case the Committee scored higher, and in two cases the Committee scored lower.

The Committee is aware of the fact that their review of a selection of the theses is only part of the full final assessment of the competencies achieved by a particular student.

Based on the reviewed theses, the Committee feels that the BSc graduates have achieved the final qualifications. The use of the English language in the theses should be improved.

The score for this Facet is ‘Sufficient’.
The target propaedeutic success rate and the target Bachelor’s success rate both equal 70%. The realised propaedeutic success rate within 2 years increased to 78%, and the Bachelor’s success rate within 4 years currently equals 29%. Over the years (2001 – 2003) the drop-out rate of first-year students decreased from 39% to 26%. The Department attributes this decrease to the maturation of the Bachelor’s programme and therefore the better position of the ID Department to inform prospective students so that they can make a better judgement of their capabilities for the Bachelor’s programme.

The Committee notes that a weak selective function of the first Bachelor’s year could be a cause for the relatively high propaedeutic success rate and the relatively low Bachelor’s success rate.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 6 is ‘Sufficient’.

3.4. The Assessment Protocol TU/e MSc ID

3.4.1. Objectives of the degree courses (Topic 1)

The Department of Industrial Design (ID) started in 2001 and is still in its development phase. Many aspects of such a new department are developed at the same time: the new definition of the contents of industrial design, the programmes, the educational model, staff, research, facilities, and the international network. In the course of time a new discipline that rules the field of Industrial Design is to be developed by integrating the three paradigms: Engineering, Science and Design. The vision of this integration for ID forms the basis for a great opportunity to contribute to the development of the trans-discipline Industrial Design.

Right from the start in 2001, the Department decided to focus on intelligent products, systems, and services. The new industrial design engineer educated at the Eindhoven University of Technology (TU/e) should be able to integrate four important fields of knowledge: Design, User, Technology, and Business. The development of competencies rather than the acquiring of knowledge is considered paramount in the competency-centered learning model that has been adopted for the Bachelor’s and Master’s ID programmes. Needless to say, the emphasis is on the development of the student rather than on the development of products. A large part of the Master’s programme takes place in what is called the domains: Empowering People and Intelligent Spaces.

The MSc graduate is competent in a wide scope of Industrial Design Engineering as expressed by the competency framework that underlies the programme.
The competency framework consists of six core competencies, reflecting the domain of Industrial Design and four meta-competencies, fundamental to the academic level of the graduated professional. The core competency areas are: Ideas & Concepts, Integrating Technology, User Focus & Perspective, Socio-cultural Awareness, Market Orientation and Form & Senses. The meta-competency areas are: Multidisciplinary Teamwork & Communication, Design & Research Processes, Self-directed & Continuous Learning, and Analysing Complexity. The competencies can be considered the final qualifications of the degree course.

The IDE programmes (within Delft University of Technology, Eindhoven University of Technology and University of Twente) have laid down the competencies and labour market positions of IDE graduates and the distinction between Bachelor’s and Master’s levels in a common domain-specific reference frame (DSRK).

The TU/e ID Department is in contact with many institutions in and outside the Netherlands, for example, Georgia Tech Atlanta in the USA. The Woodruff School of Mechanical Engineering at Georgia Tech Savannah plans to build a programme based on the same principles as the TU/e ID programme, in cooperation with the TU/e ID Department. In addition, the IDE Faculty of TU Delft has consulted the TU/e ID Department to explore ideas about the introduction of a competency-centered learning model in their new Bachelor’s programme.

The Department has established an international Advisory Board, composed of experts in different ID-related fields from all over the world. The Advisory Board meets with the ID Department Board twice a year to discuss developments in the ID field.

The score for this Facet is ‘Sufficient’.

### F2: Level
The final qualifications of the degree course correspond to general, internationally accepted descriptions of the qualifications of a Bachelor or a Master.

The competency framework of ID is the description of the competencies (final qualifications) that are needed to become a BSc and MSc ID engineer graduate. The competency framework has been related to the so-called Dublin Descriptors and their further detailing in the Criteria for Academic Bachelor’s and Master’s Curricula. These criteria are formally accepted by NVAO as a more expanded and relevant statement of the Dublin Descriptors which must be respected, as required by the QANU protocol. By having developed and implemented these criteria, the three Dutch universities of technology stand out positively from other universities in the Netherlands.

The criteria describe, in detail, the distinction in level between academic Bachelor’s and Master’s degrees and the range of intellectual attributes and understanding of contexts that a trained engineer may require, depending on career direction. Therefore, these criteria are more suitable for a specific qualitative examination of the Bachelor’s and Master’s programmes concerned than the Dublin Descriptors.

As the formulation of the TU/e ID Bachelor’s and Master’s programmes achievement levels complies with the Criteria for Academic Bachelor’s and Master’s Curricula, compliance with the Dublin Descriptors is assured.
The difference between Bachelor’s and Master’s competencies is based on the increasing level of complexity and abstraction, and the level of independence that is required of the students dealing with them.

Based on the analysis performed by the Faculty and the verification carried out by the Committee, it can be concluded that the final qualifications of the degree courses meet the requirements laid down in the Dublin Descriptors.

The score for this Facet is ‘Good’.

<table>
<thead>
<tr>
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</tr>
</tbody>
</table>

The final qualifications of the TU/e programmes are described in a competency framework that matches the requirements of the national academic discipline, the international academic practice and the prospective professional field as described under Facets 1 and 2 above.

The ID MSc graduate is a scientifically educated, engineering-driven individual with a full academic Master’s degree. ID MSc graduates are required to be independent practitioners within the industrial design profession, and thus be able to understand the complicated challenges of designing products, systems and services, and to initiate and execute research and design activities that will lead to the creation of successful solutions.

Although no Master’s students had graduated at the time of the review, the Department expects that, after graduation, some 80% of the students will enter the labour market to become an industrial designer and some 5% will start up a business as a design entrepreneur. The remaining 15% of the students are expected to specialize as design researchers and prepare for a PhD. At the time of the evaluation, the ID department had 17 PhD students, none of whom held an ID Master’s degree from TU/e because no ID Master’s students had graduated yet.

Some of the Master’s students interviewed expressed that they would like to see more of the academic challenge and research aspects of the modules reflected in their projects, the latter which they characterized as: “preferring the pace of industry rather than the depth of academia”.

The programme contains both a design project and a research project; the Department expects all projects to be of an academic level. With the design projects it can happen that the pace of industry is felt more, because of external clients (from industry).

The objectives (competencies) are in line with the national/international academic, domain-specific and professional requirements. The latter are assured by the set-up and operation of the Advisory Board. The Department has planned to specify the Bachelor’s and Master’s levels
further in terms of the final qualifications and to conduct an international benchmarking to verify compliance with the above-mentioned requirements.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 1 is ‘Sufficient’.

3.4.2. Programme (Topic 2)

F4: Requirements for university degree courses
The programme meets the following criteria applicable to a degree programme at a University (WO):
• The students acquire knowledge on the interface between teaching and academic research within the relevant disciplines;
• The programme follows the developments in the relevant academic discipline(s), as it is demonstrated that it incorporates current academic theories;
• The programme ensures the development of skills in the field of academic research;
• For those courses for which this is applicable, the course programme has clear links with the current professional practice in the relevant professions.

At the time of the evaluation, three research groups were active: ‘Designed Intelligence’, ‘User Centred Engineering’ and ‘Designing Quality in Interaction’. A fourth research group ‘Business Process Design’ started up in April 2007. These research groups provide the knowledge base for the Bachelor’s and Master’s programmes and drive the development of the knowledge needed for the design of intelligent systems, products and related services as well as for the development of the new trans-discipline of ID. The research staff is involved in educational activities 50% of their time.

While a student is developing a particular competency, s/he needs to acquire and use new knowledge, skills and attitudes in a specific context. At the ID Department such a context is always related to designing in one of the two domains: Empowering People and Intelligent Spaces. Becoming an ID MSc graduate requires competency development in all ten competency areas described under Facet 1. This implies that the focus in programme development is on learning activities. Learning activities, like projects, assignments and individual learning, offer the student the opportunity to acquire new knowledge, skills and attitudes.

Each of the two years of the Master’s programme is divided into two blocks, consisting of projects and modules. The project in the first block of the first year is a design project, and in the second block, a research project. The first block of the second year is reserved for modules and a class, the second block is entirely reserved for the Final Master Project (FMP). In a typical semester the ID Master’s student is engaged in both a project and modules which involve team as well as individual work.

The modules in the Master’s programme have a prime link to a competency area although, more than in the Bachelor’s programme, different competencies can be linked to one particular module. Professors are responsible for the contents of the modules and for coordinating them. A domain core team consists of researchers (as part of their educational task) and staff from the professional field; all full professors are linked to a particular domain. The core teams contribute to the development of student projects. The research groups are directly linked to the research project in the second block of the first year.
The score for this Facet is ‘Sufficient’.

F5: Relationship between aims and objectives and contents of the programme

- The course contents adequately reflect the final qualifications, both with respect to the level and orientation, and with respect to domain-specific requirements.
- The final qualifications have been translated adequately into learning targets for the programme or its components.
- The contents of the programme offer students the opportunity to obtain the final qualifications that have been formulated.

The ID Master’s programme is different from many other academic programmes in that ID does not have a fixed curriculum with one learning route for all students. However, the students follow a programme in which the number and type of learning activities in the various blocks are carefully defined. Deviation needs the approval of the Board of Examiners.

The goal of the Master’s programme is that all students achieve at least a minimum level in all competency areas. The Master's students are seen as ‘employees’, challenged to develop their competencies and coached by the ‘senior employees’, staff from both research and the professional field.

The Department ensures that the minimum competency levels are achieved by offering modules and projects in relation to all ten competency areas of the framework: Ideas & Concepts, Integrating Technology, User Focus & Perspective, Socio-cultural Awareness, Market Orientation, Form and Senses, Multi-disciplinary Teamwork & Communication, Design & Research Processes, Self-directed & Continuous Learning, and Analysing Complexity.

The achievement of the minimum competency levels is facilitated by the execution of projects, the mix of obligatory and elective modules, and a class. In the Master’s programme, the assessment of the student and the input from his/her coach form the basis for the selection of modules needed for the achievement of the final qualifications.

All modules and projects have learning goals – and sometimes prerequisite levels – described. It is the opinion of the Committee that the modules and projects contents are adequate to achieve the learning goals described. By mapping these modules and projects against the ten competency areas the Department has demonstrated that the final qualifications are achieved by completing the Master’s programme.

Professors are directly responsible for the contents of the modules. The researchers, including the professors, and external professional staff all contribute to the content of the design and research projects.

The score for this Facet is ‘Good’.

F6: Coherence of the programme

Students follow a programme of study that is coherent in its contents.

The first semester of the first Master’s year carries a ‘designer’ perspective, the second semester a ‘design research’ perspective.
Further coherence in the Master’s programme is provided by the two specialization directions the student has to chose at the start of the second Master’s year: specialization in content (i.e. Technology, Design or User) and specialization in career perspective (i.e. Designer or Design Researcher). These choices are supported by all learning activities (projects, modules and class) the student has executed in the first Master’s year.

Along with the concept of competency-centered learning, the concept of experience-based learning underlies the educational model of the TU/e ID programme. A generally recognised strength of this concept is its coherence; the students start designing from their first day onwards. In this way they experience the need to develop specific competencies and learn to evaluate their usefulness.

The score for this Facet is ‘Good’.

F7: Study load
The programme can be successfully completed within the set time, as certain programme-related factors that may be an impediment to study progress are removed as much as possible.

The study load is spread evenly over the ID programme: 30 EC per semester, on the basis of 40 hours per week. Evaluation results show that students did not spend more time on average on their modules than the study load (40 hours).

The score for this Facet is ‘Sufficient’.

F8: Intake
The structure and contents of the programme are in line with the qualifications of the students that embark on the degree course:

- Bachelor’s degree at a University (WO): VWO (pre-university education), propaedeutic certificate from a University of Professional Education (HBO) or similar qualifications, as demonstrated in the admission process.
- Master’s degree at a University (WO): bachelor’s degree and possibly selection (on contents of the subject).

The intake in the ID Master’s programme consists almost exclusively of students who recently completed their ID Bachelor’s programme at TU/e. However, IDE BSc graduates from TU Delft and UT have unconditional access. Bachelor’s students from related 3TU programmes have access with a homologation programme (30 EC). The Bachelor’s programmes which qualify for this route are documented by 3TU.

BSc graduates in IDE and allied programmes of Dutch polytechnics and other students (foreign) who have been admitted to the homologation (bridging) programme by the Departmental Admission Committee (FTC) and who have successfully completed their homologation programme are allowed to start the Master’s programme.

The Master’s programme is promoted during special information evenings and at the Master’s fair. Students visiting the evening sessions mostly come from universities of professional education. The Master’s programme is rather new, and not much information about activities (i.e. about modules and projects) is available yet on the web.
Not every student possesses sufficient self-drive to suit the competency-centered learning model of the TU/e ID programme. Such students could be better off in one of the other ID programmes of 3TU.

The Committee concludes that the contents of the TU/e ID Master’s programme are in line with the qualifications of the students who embark on the degree course. The information available on the web is still limited but is expected to increase as a result of the further development of the Master’s programme.

The score for this Facet is ‘Sufficient’.

**F9: Duration**
The degree course complies with formal requirements regarding the size of the curriculum:
- Bachelor of a University (WO): 180 credits as a rule.
- Master of a University (WO): a minimum of 60 credits, dependent on the relevant degree course.

The Master’s curriculum has a study load of 120 European Credits (one EC nominally corresponds to 28 hours of study) and a nominal study duration of two years.

The curriculum size of the Master’s programme is in accordance with the European Credit Transfer System (ECTS).

The score for this Facet is ‘Sufficient’.

**F10: Coordination of structure and contents of the degree course**
- The didactic concepts are in line with the aims and objectives.
- The teaching methods correspond to the didactic concept.

The ID Master’s programme started in the academic year 2004/2005 and is still under development.

The competency-centered educational model is based on the vision that designing is a profession that is experience-based by nature. The design engineering competencies are learned and formed in a cycle that begins with the actual design experience in a project, followed by knowledge acquisition in modules and individual learning time. The competency-centered educational model and ‘self-driven development’ stand for the student’s future professional environment.

The Committee is impressed by the extent to which the educational model and the related different ways of learning (‘Competency-centered’, ‘Experience-Based’, ‘Collaborative and Individual’, and ‘Self-directed and continuous’ learning) have been implemented in the Master’s curriculum and associated fields like, for example, assessment and examinations.

In a typical semester the Master’s student is engaged 50% in a project or in a class (in-depth specialization). The other 50% is devoted to modules. The project is usually carried out individually, and the various modules are carried out in small groups. From 2006/2007 onwards a mix of modules is being developed, offering the student the possibility to select those modules that best fit their competency development.
Students define their own Final Master Project (FMP) in agreement with their coach, the domain's core team, and with their personal development plan. The project is either a design project with a client or a research project and can be executed internally or externally. In both cases the supervision is done by the Department.

The score for this Facet is ‘Sufficient’.

**F11: Assessments and examinations**
The system of assessments and examinations provides an effective indication whether the students have reached the learning targets of the course programme or its components.

The ID Department has implemented an assessment system that fits the principles of a competency-centered educational model.

The Master’s assessment and examination system is based on the students’ semester reports and on an assessment seminar with an assessment panel. In the semester report the student documents the what, how, and why of his/her individual projects, supported by evidence. Module work that is integrated in the projects is included. These reflections capture the students’ professional development.

The semester report, module feedback, and the student’s presentation are input for the assessment seminar. The assessment panel consists of three members: two independent members and the coach. At the seminar, the panel has an in-depth discussion with the student. Immediately following the seminar, the panel members decide on a joint tentative verdict and justification. Criteria are the student’s development and progress, the student’s achievement with the specialization, work completion requirements, quality of the student’s reports, and the student’s growth as a designer. The assessment is summarized in a verdict: ‘Promotion’ (P), ‘Hold’ (H) or ‘Conditional promotion’ (C). The tentative verdict is discussed and verified at a plenary assessor meeting to arrive at a final verdict.

Each assessment is concluded with an evaluation of the outcomes which are discussed with the Education Committee (EC), domain managers and the Board of Examiners (BoE).

The final semester of the Master’s programme is reserved for the FMP. The assessment criteria for this project and for the assessment of the final semester are still under development.

The BoE approves the procedure developed and standards set by the Director of Education, who in turn consults the EC about the procedure and standards adopted. Every year a training is organized to familiarize new staff with the assessment procedure. The list of assessors is approved yearly by the BoE. The BoE also monitors the proper execution of the assessment procedure. Students can submit an appeal with the BoE if they do not agree with an assessment. In some 5% of the cases an appeal is submitted, of which 0% is granted (this is about 1% of all assessments carried out).

Students and lecturers were unanimous in saying that some need for grading has been identified, in addition to the system of verdicts, for example because foreign universities and institutes often ask for a grading.

The Faculty does see the need of giving a distinction to the top 5-10% of the students (cum laude), as
this is often asked when students want to go abroad (either for exchange or Master’s programme).

The Committee is convinced of the carefulness and effectiveness of the assessment procedure developed for the competency-centered educational model, but has some doubts about its efficiency. The procedure, in which the students receive written feedback in all stages of their learning activities, is certainly time-consuming. The Committee is concerned about whether this assessment procedure is sustainable in the context of growing student numbers.

No Master’s students had graduated at the time of the review, and therefore the full system of assessment and examinations has not been tested yet.

Therefore, the score for this Facet is ‘Sufficient’.

The overall score for Topic 2 is ‘Sufficient’.

3.4.3. Deployment of staff (Topic 3)

As a rule, the scientific staff spends 50% of its time on research and 50% on educational tasks, including overhead, with the exception of PhD students, for whom the figures are 80% and 20%, respectively.

The intention is that 75% of the teaching tasks will be done by permanent staff and 25% by staff from other TU/e departments and by the professional field. At the time of evaluation these percentages were 58% and 42%.

All full and associate professors have a PhD, as have 70% of the assistant professors.

The link with the professional practice is made in projects where external designers contribute to the development of projects and act as an ‘external coach’ providing feedback for the self-evaluation (SE). The link is also made in specialist courses by guest lecturers from design firms and industrial companies.

The score for this Facet is ‘Sufficient’.

Currently, 17 fte of the ID staff are available for education from a total of 44 fte. When the staff from other faculties and external staff teaching in the ID programmes is counted as well, 35.4 fte is available.

Lecturers interviewed highlighted that a competency-centered educational model means that approximately 80% of the educational tasks (of the 35.4 fte) consists of coaching, the expert
The matching of growing student numbers with the ‘labour-intensive’ educational model chosen will become a great challenge for the Department when the student:staff ratio approaches 20. The creative use of ICT by developing, for example, web-based self-study modules may help to alleviate the situation, although the high impact of the coaching tasks will remain.

The score for this Facet is ‘Good’.

**F14: Quality of staff**

The staff is sufficiently qualified to ensure that the aims regards contents, didactics and organization of the course programme are achieved.

The motto of the personnel policy of both TU/e and the ID Department is: “Excellent people attract excellent students”.

When attracting new scientific staff, the ID Department uses the selection procedure and criteria for scientific staff formulated at the TU/e level augmented with ID-specific selection criteria. The professional development of PhD students and young assistant professors is stimulated by specific training programmes. In addition, the ID Department offers various courses to support academic leadership, like ‘the quality of education’, ‘management of competency development’ and ‘the English language’. Furthermore, all new teaching staff have to follow a compulsory introduction programme about the educational model and the roles of the core team members, as well as didactical courses like ‘teaching and learning in higher education’.

All full and associate professors hold a PhD, as do 70% of the assistant professors. Four assistant professors are actively working on their PhD.

In their evaluation of the modules, Master’s students confirm that they regard their assignors and module lecturers to be experts in their field.

A review of the teaching staff and their field of expertise confirms that the expertise and background of the teaching staff cover the areas of the competency framework.

The teachers are well prepared for their teaching duties, with respect to both their field of expertise and the required skills of coaching and lecturing. The lecturing staff is trained for their coaching role in a one-day coaching workshop. Moreover, a buddy system has been introduced to provide peer support for the coaches. Monthly inter-vision meetings are conducted for all the lecturers to mutually reflect on their coaching activities.

In 2005 an annual cycle of ‘performance and personal development interviews’ started.

The score for this Facet is ‘Good’.

**The overall score for Topic 3 is ‘Sufficient’**.
3.4.4. Facilities and provisions (Topic 4)

<table>
<thead>
<tr>
<th>F15: Material facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>The accommodation and material facilities are sufficient to implement the programme.</td>
</tr>
</tbody>
</table>

The facilities for the Master’s students seem to be well integrated with the research facilities.

The ID Department participates in the TU/e ‘Notebook project’, which means that each first-year student can buy a notebook and software under attractive conditions. For tasks that need more powerful or dedicated software and hardware, students can use a variety of dedicated up-to-date facilities such as high-end PCs located on the Department premises. A service desk is in operation to support staff and students with queries concerning hardware and software and audiovisual attributes. Wireless access to the Internet is available in most zones within the Department.

Through the IDportal students have access to electronic documentation, including their own portfolio.

A review of the information on the IDportal in 2006 indicated that there was room for improvement. A project has been started up to focus on improving the IDportal as a document management system (to be completed by the end of 2007). At the same time TU/e is working on a user-friendly portal for students and staff that gives access to all educationally related databases, including Studyweb and the Department’s IDportal document management system. (Studyweb is a type of course management tool already in use by other TU/e departments. It provides a framework for the current and future communication needs of the TU/e Departments. Studyweb is embedded in OWIS, the student progress administration and reporting system.)

The material facilities are considered adequate by the students.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F16: Student support and guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The student support and guidance, as well as the information given to students are adequate for the purpose of students’ progress.</td>
</tr>
<tr>
<td>• The student support and guidance, as well as the information given to students meet the requirements of the students.</td>
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</tbody>
</table>

All TU/e departments use the central OWIS system for the registration of study progress. The students are automatically notified by email when new examination results have been added. Descriptions of assignments and projects can be found on OWIS.

A coach is responsible for the coaching of several MSc students with respect to both the project work (progress, deliverables) and the students’ competency development. As a rule the coach has a weekly meeting with the student. Consequently, students who make insufficient progress and/or lack motivation are quickly spotted by the coaches.

The coach can also refer a student to the study advisor. The study advisor invites students proactively for a meeting to discuss – the cause of – lack of progress. Students in turn can schedule
an appointment with the study advisor any time to discuss ID and programme related issues or personal problems. Coaches and study advisor can refer students to the Education and Student Service Centre for specialist services. Master’s students indicated in the general questionnaire 2005/2006 that they are very content with the work of the study advisors.

The score for this Facet is ‘Good’.

The overall score for Topic 4 is ‘Sufficient’.

3.4.5. Internal quality assurance (Topic 5)

<table>
<thead>
<tr>
<th>F17: Evaluation of results</th>
</tr>
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<tbody>
<tr>
<td>The degree course is subject to a periodic review, which is partly based on verifiable targets.</td>
</tr>
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</table>

The Internal Quality Assurance System offers a structured approach for the monitoring and review of the various topics identified by the NVAO accreditation system. From February 2005 onwards, the system is being developed in a systematic way. The IQA activities initiated by the system are driven by a year plan. The system is valid for both the Bachelor’s and the Master’s programme. Priority has been given to the evaluation of the educational activities.

Currently, the systematic evaluation and reporting on the assignment, project and semester level have been implemented. Furthermore, internship and the Individual Bachelor Project (IBP) are evaluated by default.

The further implementation of the IQA system at the Bachelor’s and Master’s programme level is in progress.

A professional self-assessment report, presenting a clear summary of strengths and weaknesses and future actions for each topic, is one of the products of the IQA system.

Targets have been defined for the quantitative results of the Master’s educational processes.

The score for this Facet is ‘Sufficient’.

<table>
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<tr>
<th>F18: Measures to effect improvement</th>
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<tbody>
<tr>
<td>The results of this evaluation form the basis for measures that can be demonstrated to improve the course and that will contribute to reaching the targets.</td>
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</table>

As 2005/2006 was the first year in which activities like assignments and projects were systematically evaluated, there were examples of the ‘plan-do-analyse-improve’ cycle presented on other topics (for example, the assessment organization and the IBP).

The evaluation results are discussed with the responsible staff, and measures for improvement (follow-up) implemented the next time an assignment (or module or project) is done.
As a rule, the results of follow-up of recommendations will be formally discussed the next time the activity concerned is evaluated. At this stage a formal follow-up process is not deemed necessary by the Faculty.

The score for this Facet is ‘Sufficient’.

<table>
<thead>
<tr>
<th>F19: Involvement of staff, students, alumni and the professional field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff, students, alumni and the professional field in which graduates of the course are to be employed are actively involved in the internal quality assurance.</td>
</tr>
</tbody>
</table>

Teaching staff and students are actively involved in all phases of the quality assurance process.

A strong student network exists, supporting the review and feedback of students in relation to the Bachelor’s and Master’s programmes, for example, in addition to the student representation in the Education Committee (EC), the Faculty Counsel (FSR) and an active study association (Lucid); ‘Jaarraden’ and ‘Koepeloverleg’ exist in which students are active.

The Department aims at giving special attention to the involvement of alumni, as this group is now slowly growing, and of the professional field, as they are only involved in internal quality assurance through the internship evaluation.

The EC discusses the planning of IQA activities, the evaluation of the results and the recommendations for improvement.

The score for this Facet is ‘Sufficient’.

The overall score for Topic 5 is ‘Sufficient’.

### 3.4.6. Results (Topic 6)

<table>
<thead>
<tr>
<th>F20: Level that has been achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>The final qualifications that have been achieved correspond to the targets set for the final qualifications in level, orientation and domain-specific requirements.</td>
</tr>
</tbody>
</table>

At the time of the review, no Master’s students had graduated, and consequently, no Master’s theses could be reviewed. However, during the visit the Committee attended a poster session in which the Master’s students presented projects and thesis work in progress. On the basis of the presentations delivered, discussions with Master’s students and teachers, and study of the documentation, the Committee is confident that the final qualifications with respect to the competency areas identified will be achieved.

The score for this Facet is ‘Sufficient’.
A target Master’s yield of 70% has been set. Because the ID Master’s programme was started in 2005, no Master’s students have, so far, graduated. Hence, no data are available to assess the results of teaching.

The score for this Facet is ‘Sufficient’.

**The overall score for Topic 6 is ‘Sufficient’**.
Appendix A: Appointment Notice (“Instellingsbesluit”)

APPOINTMENT NOTICE FOR SITE VISIT COMMITTEE
INDUSTRIAL DESIGN ENGINEERING
7 May 2007

The Board of the Quality Assurance Netherlands Universities Foundation (QANU), with regard to its letter dated 13 April 2007 sent to the Board of Governors of the universities concerned about its intention to organise an educational visit for the Industrial Design Engineering Faculties in 2007 and the letters of intent received from those Boards of Governors,

DECRES

A. the establishment of a Review Committee for the Bachelor’s and Master’s programmes of Industrial Design Engineering, respectively;

B. the appointment as chair, and member, of the Review Committee

• Mr. A.C. (Andre) Rotte, Vice-president, Philips Design;

C. the appointment as members of the committee:

• Prof. F. (Farrokh) Mistree, Professor of Engineering and Design, Georgia Institute of Technology, Atlanta, USA;
• Prof. M. (Mats) Hanson, Professor of Department of Mechatronics, Royal Institute of Technology (KTH), Stockholm, Sweden;
• Prof. J. (Jacky) Helleman, Professor of Physics and Astronomy, Katholic University, Leuven, Belgium;
• Mrs. K. (Katinka) Bergema, student member, Delft University of Technology;
• Mr. C. (Stan) Vriezenga, student member, University of Twente;
• Mr. T. (Thomas) Visser; student member, Eindhoven University of Technology

D. the appointment as secretary of the committee:

• Mr. P. (Peter) C. van Holten from the QANU office

E. the setting of the following conditions for conducting the site visit for the Bachelor’s and Master’s programmes in Industrial Design Engineering:

a. the task of the Review Committee is based on the information provided by the respective Faculties concerned and interviews conducted during the site visit:
1. to evaluate the various quality aspects of the programmes concerned, as described in the QANU protocol;
2. and to determine on that basis whether the programmes meet the criteria for fundamental quality in its opinion, and
3. to identify the aspects of the programmes that could be improved in its opinion;

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*Guide for the external evaluation of quality of research-oriented Bachelor’s and Master’s programmes for the purposes of Accreditation, January 2004*
b. the findings of the Review Committee about the programmes will be presented in a report according to the model given in the above-mentioned QANU protocol; the Committee will issue its report to the Board of QANU;

c. the following Industrial Design Engineering programmes are involved:

<table>
<thead>
<tr>
<th>University</th>
<th>Faculty</th>
<th>Programmes</th>
<th>CROHO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delft University of Technology</td>
<td>Industrial Design</td>
<td>Industrial Design Engineering (Bachelor)</td>
<td>56955</td>
</tr>
<tr>
<td></td>
<td>Engineering</td>
<td>Integrated Product Design (Master)</td>
<td>66955</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Design for Interaction (Master)</td>
<td>60355</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strategic Product Design (Master)</td>
<td>60356</td>
</tr>
<tr>
<td>Eindhoven University of Technology</td>
<td>Industrial Design</td>
<td>Industrial Design (Bachelor)</td>
<td>50441</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Industrial Design (Master)</td>
<td>60441</td>
</tr>
<tr>
<td>University of Twente</td>
<td>Applied Natural Sciences</td>
<td>Industrial Design Engineering (Bachelor)</td>
<td>56955</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Industrial Design Engineering (Master)</td>
<td>66955</td>
</tr>
</tbody>
</table>

d. the Review Committee will conduct its task according to the guidelines of the QANU protocol, including the terms with respect to the independence of the Committee members;

e. a copy of this Decree will be sent to:

- the Executive Board of the universities concerned;
- the members of the Review Committee;
- the Faculty Boards involved;
- the Chair of the VSNU;
- the Chair of the Deans’ Council;
- the participants in the Quality and Accreditation Council (K&A-overleg);
- the Education Inspectorate;
- the Chair of NVAO;
- the Ministry of Education, Culture & Science (OCW).

Utrecht, 7 May 2007

QANU Board,

Drs. J.G.F. Veldhuis
chair
Appendix B: Curricula Vitae of the Committee Members

Mr. Andre C. Rotte
Andre Rotte was born in Vught, the Netherlands in 1947. He graduated from the “Akademie Industriele Vormgeving Eindhoven” with a diploma in Product Design and worked at the completion of his graduation project (Electrische Stads- en Forensen Auto) as a “technical assistant” at the University of Eindhoven, department of Engineering. He set up his own Design consultancy with partner Paul Driessen in Zaltbommel in 1974 and served clients in the lighting and furniture industry, such as Raak Lighting and Roskam Meubelindustrie.
In 1975 he partnered with prof. A.H.Marinissen in Buro IV to work for clients in the professional products sector such as Fokker Aircraft Industries, Grasso Cooling, Bronswerk Airconditioning and Esso Nederland.
In 1985 he joined Philips Corporate Industrial Design to manage design in the Lighting Division which was quickly followed by a position as Design Manager for the personal Care business group of Philips (Philishave, Ladeyshave, Suncare). In 1987 he was assigned to the Philips Division of Domestic Appliances and Personal Care as a senior Design Manager and became member of the Design Policy Committee of Philips. Andre joined the management team of Philips Corporate Industrial Design in 1990.
Stefano Marzano, the new CEO of Philips Design in 1991, asked Andre to take up the position of Global Design Services Portfolio Director, with a focus on developing the new capabilities in the new Philips Design organization. Within this portfolio the function of Research and Development was initiated and given shape through development of the relationship with Philips Research, European Community projects and the establishment of the Human Behavior Research Center at Philips Design as well as building out contacts with Research and Academic institutes worldwide.
Until November 2007, Andre held as a senior vice president, the portfolio of Business Process Management which entailed the global management and coordination of all main and enabling processes of Philips Design, further he was responsible for strategy development and deployment as well as Business Improvement (Quality) and Information Technology. Special assignments were the development of “Design services for the New Emerging Markets” and “Design for Immersive Virtual Space”.
From November 2007 Andre is working as an independent consultant in the field of the integration of design in organizations.
Andre has served as member, president and in the advisory board of the former Dutch Society of Industrial Design (KlIO), and was a board member of the Bureau of European Designers Associations. During his career he lectured many times on the subject of Design and Design management in international and educational settings.

Prof. Farrokh Mistree
Professor Mistree was born in Poona, India in 1945. Professor Mistree was awarded the Bachelor of Technology (Honors) degree by the Indian Institute of Technology, Kharagpur, India, in 1967. He graduated with a Master of Science and a PhD from the University of California, Berkeley, in 1970 and 1974, respectively. Professor Mistree began his academic career as a post-doctoral research fellow (1974-1976) at the University of New South Wales (UNSW), Sydney, Australia. From 1976 through 1980 he served at UNSW as a Lecturer (1976-1979) and Senior Lecturer (1980). In January 1981, Professor Mistree returned to the US as an Associate Professor at the University of Houston, Houston, Texas and was promoted to the rank of professor in 1987. In Fall 1992, Professor
Mistree joined the Woodruff School of Mechanical Engineering at the Georgia Institute of Technology, Atlanta. In 2005, Professor Mistree was appointed Associate Chair of the Woodruff School and the Associate Director of Georgia Tech – Savannah Campus.

Professor Farrokh Mistree's design experience spans mechanical, aeronautical, structural, and industrial engineering. His teaching experience spans courses in engineering design, naval architecture, solid mechanics, operations research and computer science. His current research focus is on learning how to manage design freedom in multiscale design (from molecular to reduced order models) to facilitate the integrated design of materials, product and design process chains. He is committed to developing a design pedagogy that is rooted in Decision-Based Design and adaptive action learning. It is in this context that he enjoys experimenting with ways in which design can be learned and taught.

Professor Mistree has co-authored two text-books, over 350 technical publications including around 30 papers dealing with engineering education. Professor Mistree was recognized for his research and teaching in 1999 and 2001, respectively: ASME Design Automation Committee’s 1999 Design Automation Award and 2001 Jack M. Zeigler Woodruff School Outstanding Educator Award. He served as the Secretary-Treasurer of Pi Tau Sigma Mechanical Engineering Honor Society (1994-2006) and served as a reviewer for ABET. He is a Fellow of ASME, an Associate Fellow of the AIAA, a Member of ASEE and the Society of Naval Architects and Marine Engineers.

**Prof. Mats Hanson**

Professor Hanson is Research Leader and professor of Mechatronics, Machine Design Division at the School of Industrial Engineering and Management of the Royal Institute of Technology (KTH), Stockholm, Sweden.

Mechatronics offers new possibilities and freedom in design of flexible, innovative, intelligent and user friendly products, machines and systems. Important application areas are vehicles, medical equipment, automation systems and consumer products. New and improved functionality is achieved by synergistic integration of mechanical design, control system synthesis, software engineering and embedded system design. Important topics in research and education are motion control, robotics, embedded systems, real-time programming and communication, distributed systems, dependable systems, model-based development and co-design. The interdisciplinary characteristics of the research is supported by extensive co-operation with industry and academia. The Mechatronics Lab includes two professorial chairs, one in mechatronics and one in embedded control systems.

The activities in mechatronics are organized in one education and two research themes with a group of staff and doctoral students in each theme:

**Mechatronics education:**

- mechatronics courses,
- embedded and applied control,
- electrical engineering.

Engineering of mechatronic systems is often characterized by large projects, many involved disciplines, extensive teamwork and hence requires qualified project management. For realistic training, many of the Mechatronics courses are therefore project oriented and problem based. A master-level specialization in Mechatronics is offered for the programs in Mechanical Engineering, Vehicle technology and Design and product realization.
Mechatronics research:

1. Robotics.
   - legged locomotion systems, and
   - mobile manipulation in in-door applications with focus on grasping.
   In the area of high-precision motion control the focus is on control of telemanipulation and force feedback with application to surgical robots. Mechatronic control of HCCI engines (Homogeneous Charge Compression Ignition) is another new research topic.

2. Embedded control systems research.
   - architectural design and model based development of embedded control systems.

Prof. dr. Jacqueline Hellemans
Professor Hellemans was born on 03-03-1942 in Antwerp, Belgium. She studied Physics at the Katholic University of Leuven (K.U. Leuven) and became a Master of Science in 1964. She subsequently received her Ph. D. in Physics from the same university in 1971. In 1981 she became Master in Medical Sciences at K.U. Leuven.

Professor Hellemans is professor at the Departement of Physics and Astronomy of K.U. Leuven and also involved in the training programme for academic teachers of the same university. Her research topics are: Physics of fluids, Medical physics and Physics education. She taught – in the past and at present – General Physics and Mathematics for 1st year Bachelor’s medical students and General Physics for 1st year Bachelor’s students in Physical Education. She designs experiments for 2nd year Master’s students and teaches Didactics of Physics in the teachers’ training programme for 1st and 2nd year master students Physics. Further professor Hellemans is involved in the in-service training of Physics teachers.

Katinka Bergema
Katinka Bergema was born on 01-08-1981 in Voorburg, the Netherlands. She is a Bachelor of Science and since 2006 a Master’s student Strategic Product Design at the Technical University Delft, Faculty Industrial Design Engineering.

Katinka Bergema is active as student assistant in an Industrial Design Advice Team and worked as student assistant to the head of the department of education and student affairs till June 2007. Katinka Bergema has been and still is involved in numerous activities related with her study and the Faculty’s educational programme, for example the student Council, the Bachelor team who designed the new bachelor program, the Education Committee and the Students Association, where she organized a business fair, the Summerque, an event for students and employees of the faculty. She was a member of the board as a commissioner of education in 2004-2005. She went on a research trip to China and did an internship at KOMPAN in Denmark. Katinka is a member of several committees of the overall university student council and besides her study she worked as part-time management assistant in a big restaurant in The Hague till the end of 2006.

Stan Vriezenga
Stan Vriezenga is, since 2005, a Bachelor of Science and a Master’s student ‘Design & Styling’ at the the Twente University in the Netherlands, Faculty ‘Construerende en Technische Wetenschappen’ of which Industrial Design Engineering is a part.

Stan has been, and still is, active as a student assistant to the Faculty’s Industrial Design Engineering staff and joined many activities related with the Industrial Design Engineering educational programme.
Thomas Visser
Thomas Visser was born in 1983 in Naarden, the Netherlands. He became a Bachelor of Science in Industrial Design at the Eindhoven University of Technology (TU/e) in the Netherlands in 2005. Following his BSc graduation he attended a semester at the Design Academy Eindhoven at the departments of Communication and Public Space. After finishing that semester, he started his Master’s studies at TU/e, Department of Industrial Design. He finished this course in August 2007, becoming a Master of Science in Industrial Design.
While studying at TU/e, Thomas was involved in several committees and activities related with the subject domain of Industrial Design and its educational programme. Thomas has helped organizing several conferences in the area of design and interaction. Also, he has been teaching freshman students in computer aided design for over four years. In 2005, Thomas was a member of both the University Council and the Industrial Design Faculty Council. In the last year of his Master’s studies, Thomas specialized in user research methodology, interaction design and intelligent environments. Currently, Thomas has a design/research position at TNO Defence, Security and Safety. He is involved in developing a future vision for first responders.
Appendix C: Domain-Specific Reference Framework

DOMAIN-SPECIFIC REFERENCE DOCUMENT
FOR THE ACADEMIC INDUSTRIAL DESIGN ENGINEERING PROGRAMMES

Table of Contents

Introduction
Profile and labour market positions of the IDE Graduates
Domains of knowledge and skills in the IDE curriculum
Differences between a Bachelor’s and a Master’s graduate: The Bachelor’s and the Master’s degree differ in terms of orientation and level
Appendix 1: Benchmark
Introduction

In this document, the three Schools of Industrial Design Engineering in the Netherlands have laid down a description of the profile and labour market positions of IDE Graduates, some specific features of the IDE curricula and the distinction between the Bachelor’s and the Master’s level.

The Schools have defined the common elements for the purposes of this document. The description of the profile and the competencies makes no distinction between the Bachelor’s and Master’s: the knowledge and skills themselves do not differ, but the level (i.e. width and depth of this knowledge and these skills) does. This difference is explained in section 4.

The Schools used a number of sources to develop this document:

- The terms of reference of the last visiting committee (IDE programme Delft, VSNU report from May 2002).
- The descriptions of the profile and objectives of the three IDE programmes.
- Criteria for Academic Bachelor’s and Master’s Curricula (Joint publication by the three Technical Universities) (Meijers et al. TU/e, 2005).
- Dublin Descriptors (NVAO protocol).

The first draft of this document has also been submitted to international and recognised colleagues (see Appendix 1).

Profile and labour market positions of the IDE graduates

The industry has a proven need7 for academically trained product designers who can integrate knowledge from different fields of technology with human factors, who can see signals from the market and can generate creative ideas with new solutions: the Industrial Design Engineer.

Profile

A BSc/MSc graduate in Industrial Design Engineering can operate in the field of Industrial Design as an interdisciplinary designer. The graduate is able to recognise the relevant disciplines and aspects, such as technology, manufacturing and logistics, market and user, business and marketing, aesthetics and functionality, and is able to integrate these aspects into the development of solutions: products or systems and related services.

7 Based on the reports:
In the process of developing products, the IDE graduate:

- is able to analyse market demands and user needs along with technological and social opportunities;
- is able to generate a personal vision on the design problem;
- is able to generate and select ideas and design concepts;
- is able to transfer existing knowledge to new problems and to implement new knowledge;
- can materialise a concept to the stage of a working model;
- is able to take into account the marketing and the product life cycle.

The graduate is an academically educated designer. He is able to use scientific methods and techniques in the development of products and in conducting research. He is able to contribute to research projects and to the development of new knowledge. He has knowledge and skills in relevant disciplines and sciences and is able to use them in reasoning and methodological reflection during/on the process of development.

The graduate is talented, independent, responsible, creative, is able to build on his/her own knowledge and skills, is able to develop his/her own signature, is able to deal with limited certainties, can communicate, can document, visualise and present his/her design, can structure his/her projects, can function both individually and in a multidisciplinary team and in an international and intercultural context.

The basis for this IDE graduate profile is formed during the Bachelor’s programme, and the profile is developed further during the Master’s programme.

**Labour Market Perspective**

Traditionally, prospects for designers in the labour market have been closely linked to the overall economic situation. In times of a booming economy, jobs were offered to graduates even before they had finished training.

In a declining economy it can take graduates one or two years to find a suitable job. However, the enormous potential of current new developments (such as smart products, smart environments and portable products) means that new industrial designers are likely to be in great demand.

More and more governments and industry are convinced that innovation and smart design are set to play a very important role in the future society.

Also, the fact that the domain of Industrial Design is widening its scope (for example to services, product-service combinations, the design of environments, the management of product development, brand design) means that the domain could soon become less dependent on the state of the economic situation.

So in the long run, the influence of design in society will increase, as will the demand for highly educated professionals in this field.

IDE graduates are found in jobs such as industrial designer, product designer, product engineer, design engineer, design manager, product manager, interaction designer, researcher, usability consultant, design-centred researcher, strategic designer, brand manager, New Product Development project leader, innovation consultant, design-brand consultant. Currently, only a few BSc graduates have entered the labour market.
Domains of knowledge and skills in the IDE curriculum

On the basis of the profile, seven areas of competency can be identified for university graduates in the IDE programme. Graduates should be competent with regard to all seven points:

1. Is competent in designing
   A university IDE graduate can realise new or modified artefacts, products or systems, with the aim of creating value in accordance with predefined needs and requirements.

2. Is competent in the IDE-relevant disciplines
   A university IDE graduate is familiar with existing knowledge and has the competence to increase and develop this through study.

3. Is competent in research
   A university IDE graduate is able to acquire new scientific knowledge through research. In this respect, research entails the development of new knowledge and insight according to purposeful and systematic methods.

4. Has a scientific approach
   A university IDE graduate has a systematic approach characterised by the development and use of theories, models and coherent interpretations, has a critical attitude and has insight into the nature of science and technology.

5. Has basic intellectual skills
   A university IDE graduate is competent in reasoning, reflecting and forming a judgment. These competencies are learned or refined within the context of a discipline, and then become generically applicable.

6. Is competent in co-operating and communicating
   A university IDE graduate is able to work with and for others. This not only requires adequate interaction and a sense of responsibility and leadership, but also the ability to communicate effectively with colleagues and non-colleagues. He is also able to participate in a scientific or public debate.

7. Takes account of the temporal, social and personal context
   Science and technology are not isolated, and always have a temporal, social and personal context. Beliefs and methods have their origins; decisions have social consequences in time. A university IDE graduate is aware of this, and has the competence to integrate these insights into his scientific work.

The IDE curriculum includes the following aspects/building blocks:

- Design Projects
- Design Methods and Techniques
- Engineering
- Management and Market Studies
- Design
- Human Factors
- Socio-Cultural Awareness
- Research Practices

Furthermore, the IDE curriculum is a programme that provides a balance between the formation, processing, application, integration and contemplation of theory and skills. The Design Projects are the core of the curricula. The other building blocks are taught and integrated in the Design Projects.
### Differences between a Bachelor's and a Master's graduate:
The Bachelor’s and the Master’s degree differ in terms of orientation and level

<table>
<thead>
<tr>
<th>A Bachelor’s graduate</th>
<th>A Master’s graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can apply knowledge in various familiar situations</td>
<td>Can apply knowledge in new situations</td>
</tr>
<tr>
<td>Can work under supervision; average level of autonomy</td>
<td>Can work independently; high level of autonomy</td>
</tr>
<tr>
<td>Can approach/tackle and solve relatively basic problems/questions (incl. design)</td>
<td>Can approach/tackle and solve more complex problems (incl. design)</td>
</tr>
<tr>
<td>Can develop knowledge and skills/competencies from related disciplines</td>
<td>Can develop knowledge and skills/competencies from various disciplines</td>
</tr>
<tr>
<td>Can integrate and apply knowledge and skills/competencies in relatively basic (design) problems/questions</td>
<td>Can integrate and apply knowledge and skills/competencies in more complex (design) problems</td>
</tr>
<tr>
<td>Can participate in the design and/or research process</td>
<td>Can adjust the design and/or research process to meet the demands of the task at hand</td>
</tr>
<tr>
<td>Has sufficient knowledge of the disciplines to judge the relevance of new developments, and can translate this to own domain</td>
<td>Has sufficient deep-seated knowledge of the disciplines to be able to form a scientific judgment, and can translate this to own domain</td>
</tr>
<tr>
<td>Can use scientific research findings in the design process and can perform a simple research project under supervision</td>
<td>Can plan and perform scientific research and can reflect on the phases of the research process</td>
</tr>
<tr>
<td>Can communicate opinions, ideas, information and results clearly</td>
<td>Can communicate conclusions, including the underlying knowledge, motives and deliberations, clearly, convincingly (and unambiguously)</td>
</tr>
</tbody>
</table>
Appendix 1: Benchmark

This Domain-Specific Reference Document has been jointly created by the three Dutch Departments of Industrial Design Engineering. The process involved consultations with various experts in the field of IDE.

<table>
<thead>
<tr>
<th>TU Delft: Members of the Education Advisory Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.F. Bezemer</td>
</tr>
<tr>
<td>J. Bouma</td>
</tr>
<tr>
<td>J. Geraedts</td>
</tr>
<tr>
<td>L.M. Huiskens, MBA</td>
</tr>
<tr>
<td>R. Kemna</td>
</tr>
<tr>
<td>B. Bluemink</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TU/e: Members of the Advisory Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. D. Chan</td>
</tr>
<tr>
<td>Ms. L. Edelkoort</td>
</tr>
<tr>
<td>Prof. E. Manzini</td>
</tr>
<tr>
<td>M.M.R. Maier</td>
</tr>
<tr>
<td>Prof. I. McAra-McWilliam</td>
</tr>
<tr>
<td>Dr. S.L. Marzano</td>
</tr>
<tr>
<td>Prof. A. Pilot</td>
</tr>
</tbody>
</table>

The Advisory Board of the Department of IDE of the University of Twente will be consulted in September 2006.
### Appendix D: Assessment Summary Industrial Design Engineering 2007

<table>
<thead>
<tr>
<th>Topic 1: Objectives of the degree course</th>
<th>UT BSc</th>
<th>UT MSc</th>
<th>TU Delft BSc</th>
<th>TU Delft IPD</th>
<th>TU Delft DFI</th>
<th>TU Delft SPD</th>
<th>TU/e BSc</th>
<th>TU/e MSc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facet 1: Domain-specific requirements</td>
<td>Sufficient</td>
<td>Sufficient</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Sufficient</td>
<td>Sufficient</td>
</tr>
<tr>
<td>Facet 2: Level</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Facet 3: Orientation</td>
<td>Sufficient</td>
<td>Sufficient</td>
<td>Sufficient</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Sufficient</td>
<td>Sufficient</td>
</tr>
</tbody>
</table>

### Topic 2: Programme

| Facet 4: Requirements University        | Sufficient | Sufficient | Sufficient | Sufficient | Good | Sufficient | Sufficient | Sufficient |
| Facet 5: Relationship between aims and objectives and contents of the programme | Sufficient | Sufficient | Good | Sufficient | Good | Good | Good | Good |
| Facet 6: Coherence of programme         | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Good | Sufficient |
| Facet 7: Study load                     | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient |
| Facet 8: Intake                         | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient |
| Facet 9: Duration                       | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient |
| Facet 10: Coordination of structure and contents of the programme | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Good | Sufficient |
| Facet 11: Assessment and examinations   | Sufficient | Sufficient | Sufficient | Good | Sufficient | Good | Good | Sufficient |

### Topic 3: Deployment of staff

| Facet 12: Requirements for University   | Sufficient | Sufficient | Sufficient | Sufficient | Good | Good | Sufficient | Sufficient |
| Facet 13: Quantity of staff            | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Good | Good |
| Facet 14: Quality of staff             | Sufficient | Good | Sufficient | Good | Good | Good | Good | Good |

### Topic 4: Facilities and provisions

| Facet 15: Material facilities          | Sufficient | Sufficient | Good | Good | Sufficient | Sufficient | Sufficient | Sufficient |
| Facet 16: Student support and guidance | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Good |

### Topic 5: Internal quality assurance

| Facet 17: Evaluation of results        | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient |
| Facet 18: Measures to effect improvement | Sufficient | Sufficient | Good | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient |
| Facet 19: Involvement of staff, students, alumni professional field | Sufficient | Sufficient | Good | Good | Good | Good | Sufficient | Sufficient |

### Topic 6: Results

| Facet 20: Level that has been achieved | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient |
| Facet 21: Results of teaching         | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient | Sufficient |
Appendix E: Visit Programmes

Visit Programme
2007 Educational Evaluation Industrial Design Engineering, UT

1st day, May 8

08:30-10:30 Committee meeting and review of documentation displayed such as:
• alumni review (WO-monitor),
• ICT learning environment (TeleTop),
• evaluation reports, student surveys, QA/QC manual
• minutes of Educational Committee, Examination Committee, Chamber of Professors, Disciplinary Council
• external assignments and related organisations
• BaMa thesis guidelines
• evaluation reports, study books, lecture notes, readers and examination papers + elaboration
• policy documents, development plans

10:30-11:15 Clarification:
• editors of the SER, Director of Education (& visitation coordinator & head of Education Supporting Unit)

11:15-12:15 Students involved with QA and administration e.g.:
• Student members of Education Committee and Evaluation Committee,
• engineering representatives, Faculty Council,
• Board members, Study Association Daedalus.

12:15-12:45 Committee lunch (private)

12:45-13:30 Students of Bachelor’s programme
• About 10 students 1st, 2nd and 3rd year, different levels of performance

13:30-14:30 Staff members teaching in the Bachelor’s programme

14:30-15:30 Tour of the BSc facilities of the IDE programme and presentation of BSc work

15:30-15:45 Tea break

15:45-16:30 Staff members of Examination Committee
• Staff members of Education Committee

16:30-17:15 Summary of observations IDE BSc programme

17:15-18:15 Get-together with drinks organised by UT. Further introduction of the committee to the representative of the University Board, the Dean and his management team and members of the Faculty council

18:15-18:30 Return to hotel

19:00-20:30 Committee dinner (private) to be arranged by QANU
2nd day, May 9

08:30-09:15  Students of the Master's programme (incl. pre-master programme)
09:15-10:00  Staff members teaching in the MSc programme and Master Coordinator
10:00-10:15  Break
10:15-11:00  Study Advisors, Internship Coordinator, Coordinator of Educational International Affairs (both BSc and MSc) and Mobility and BSc Assignments Coordinator and BSc and MSc Coordinator
11:00-11:45  Presentation of MSc study work
11:45-12:45  Summary of observations of IDE MSc programme and completion of assessment score sheet
12:45-13:15  Lunch committee
13:15-15:30  Preparation of close-out presentation
15:15-15:30  Break
15:30-16:00  No-surprise meeting with representative of University Board, Dean, and Director of Education
16:00-16:30  Close-out presentation (all)
All staff members and students involved in IDE programme
16:30-17:00  Drinks
All staff members and students involved in IDE programme
17:30-19:00  Dinner at Faculty Club
19:30-22:00  Bus travel to Delft
Visit Programme
2007 Educational Evaluation Industrial Design Engineering, TU Delft

1st day, May 10

08:30-10:30 Committee meeting and review of documentation displayed:
1. Alumni review (WO-monitor)
2. ICT learning environment (‘Blackboard’)
3. Evaluation reports, student surveys, QA/QC manual
4. Minutes of Education Committee, Board of Examiners and ‘Vocational Committee’ (including minutes in which the curricula were ‘approved’)
5. Study books, lecture notes and readers
6. BaMa thesis guidelines [internship and related organization]
7. Examination papers (incl. preliminary) (last three years) and elaboration
8. Policy documents, development plans

10:30-11:30 Clarification
Editors of the SER, Director of Education (& visitation coordinator), head of Education and Student Affairs Department (ESAD), QA/QC staff member.

11:30-12:30 Industrial Design Engineering (IDE) students involved with quality control, assurance and administration: e.g. representative on the Student Faculty Board (FSR), student member of the Education Committee and a board member of the Study Association (Society)

12:30-13:00 Committee lunch, private (to be arranged by TU Delft)

13:00-14:00 IDE BSc students

14:00-15:00 Lecturers of the IDE BSc programme

15:00-15:15 Break

15:15-16:15 Tour of the student facilities of the IDE programmes and BSc study work

16:15-17:00 Representatives from Board of Examiners, Board of Studies and lecture members of the Teaching Committee

17:00-17:30 Committee review of the day

17:30-18:30 ‘Get-together’ with drinks (arranged by TU Delft-IDE): further introduction of the Committee to the representative of the University Board, the Dean and his management team and representatives of the Faculty Works Council (ODC)

18:30-18:45 Return to hotel

19:30-21:00 Committee dinner, private (to be arranged by QANU)
**2nd day, May 11**

08:30-09:15  BSc Programme Coordinator and Course Coordinators for new 2007 BSc programme

09:15-10:00  Study Advisor(s), Teaching Coordinator and Coordinator of Educational International Affairs

10:00-10:30  Summary of observations, IDE BSc programme

10:30-10:45  Break

10:45-11:30  IPD MSc students

11:30-12:15  Lecturers of the IPD MSc programme and the IPD Master Programme Coordinator

12:15-12:45  Committee lunch, private (to be arranged by TU Delft)

12:45-13:45  Tour of the IDE research facilities and presentation of IPD, DfI and SPD MSc study work

13:45-14:30  Summary of observations of IPD MSc programme

14:30-14:45  Break

14:45-15:30  DfI MSc students

15:30-16:15  Lecturers of the DfI MSc programme and the DfI Master Programme Coordinator

16:15-17:00  Summary of observations of DfI MSc programme

17:00  Committee members depart for the weekend
3rd day, May 14

08:30-09:00 Lecturers of common MSc courses
09:00-09:45 Meeting with alumni
09:45-10:30 SPD MSc students
10:30-10:45 Break
10:45-11:30 Lecturers of the SPD MSc programme and the SPD Master Programme Coordinator
11:30-12:00 Summary of observations of SPD MSc programme
12:00-12:30 Completion of assessment score sheet (TU Delft)
12:30-13:00 Committee lunch, private (to be arranged by TU Delft)
13:00-15:00 Preparation of close-out presentation
15:00-15:15 Break
15:15-16:00 ‘No-surprise’ meeting with representatives of the University Board, Dean, Director of Education and Head of ESAD
16:00-16:30 Close-out presentation (invitation by TU Delft-IDE; in principle for all members of the Faculty)
16:30-17:00 Drinks
17:00-18:30 Dinner at University Club
19:00-21:00 Travel to Eindhoven
Visit Programme

2007 Educational Evaluation Industrial Design, TU/e

1st day, May 15

08:30-10:30 Welcome and introduction (Faculty Board, Director of Education and Educational Assessment Coordinator) Committee meeting and review of documentation displayed:

1. 2003 review (ext. advisory committee) and WO-monitor
2. ICT learning environment (‘Studyweb’)
3. Evaluation reports, student surveys, QA/QC manual
4. Minutes of Education Committee, Board of Examiners and Advisor Board
5. Study books, lecture notes and readers
6. BaMa thesis guidelines
7. Internship and related organization
8. Examination papers (preliminary) (last three years) and elaboration
9. Policy documents, development plans

10:30-11:30 Presentation of context (Dean: 10 min + disc.) Clarification: Editors of the SER, Director of Education, Educational Assessment Coordinator and QA/QC staff member.

11:30-12:15 Industrial Design (ID) students involved with quality control, assurance and administration: e.g. representative on the Department Council (FR), student member of the Education Committee and a board member of the Study Association (Lucid)

12:15-12:45 Committee lunch, private (to be arranged by TU/e)

12:45-13:30 ID BSc students

13:30-14:15 Lecturers of the ID BSc programme, ID BSc Programme Manager, ID BSc Domain Manager

14:15-14:45 Bachelor Advisory Group reps

14:45-15:45 Tour of the facilities of the ID programme, poster presentation of BSc study work (incl. break)

15:45-16:30 Board of Examiners, members of the Education Committee (lecturers), Assessment Coordinator

16:30-17:15 Study Advisor(s), Internship Coordinator and International Educational Affairs Coordinator

17:15-18:00 Summary of observations, ID BSc programme
18:00-19:00  ‘Get-together’ with drinks (arranged by TU/e ID): further introduction of the Committee to the representative of the University Board, the Dean and his management team and staff representatives of the Department Council (FR)

19:00-20:30  Committee dinner at TU/e University club (to be arranged by TU/e) and return to hotel

2nd day, May 16

08:30-09:15  ID MSc students

09:15-10:00  Lecturers of the ID MSc programme, ID MSc Domain Manager

10:00-10:30  MSc Management Team reps

10:30-11:15  Poster presentation of MSc study work (incl. break)

11:15-12:00  Summary of observations, ID MSc programme and completion of assessment score sheet

12:00-12:30  Committee lunch, private (to be arranged by TU/e)

12:30-14:30  Preparation of close-out presentation

14:30-14:45  Break

14:45-15:00  Committee close-out and ‘way forward’

15:00-15:30  ‘No-surprise’ meeting with representative of the University Board, Dean and members of the Faculty Board

15:30-16:00  Close-out presentation (invitation by TU/e-ID; in principle for all members of the Faculty)

16:00-16:30  Drinks
## Appendix F: List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>3TU</td>
<td>The three Dutch universities of technology</td>
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<tr>
<td>BAG</td>
<td>Bachelor Advisory Group</td>
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<tr>
<td>BaMa</td>
<td>Bachelor Master</td>
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<tr>
<td>Blackboard</td>
<td>TU Delft electronic learning environment</td>
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<tr>
<td>BoE</td>
<td>Board of Examiners</td>
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<tr>
<td>BSc</td>
<td>Bachelor of Science</td>
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<tr>
<td>Colstruction</td>
<td>Lecture accompanied by instructions and subsequent teacher support</td>
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<tr>
<td>CTW</td>
<td>The Faculty of Engineering Technology</td>
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<tr>
<td>DfI</td>
<td>Design for Interaction</td>
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<tr>
<td>DoE</td>
<td>Director of Education</td>
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<tr>
<td>DUIT</td>
<td>Didactic Training for New University Teaching Staff</td>
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<tr>
<td>DSRK</td>
<td>Domain-specific Reference Frame</td>
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<tr>
<td>EAC</td>
<td>Education Advisory Committee</td>
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<tr>
<td>EC</td>
<td>European Credit</td>
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<tr>
<td>ECTS</td>
<td>European Credit Transfer System</td>
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<tr>
<td>ESAD</td>
<td>Education and Student Affairs Department</td>
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<tr>
<td>FMP</td>
<td>Final Master Project</td>
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<tr>
<td>FSR</td>
<td>Faculty Student Council</td>
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<tr>
<td>FTC</td>
<td>Departmental Admission Committee</td>
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<tr>
<td>hbo</td>
<td>University of professional education</td>
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<tr>
<td>hl</td>
<td>Full professor</td>
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<tr>
<td>HT</td>
<td>Honours Track (programme)</td>
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<tr>
<td>IBP</td>
<td>Individual Bachelor Project</td>
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<tr>
<td>ICT</td>
<td>Information and Computing Technology</td>
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<tr>
<td>ID</td>
<td>Industrial Design</td>
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<tr>
<td>IDE</td>
<td>Industrial Design Engineering</td>
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<tr>
<td>IEPDE</td>
<td>International Engineering and Product Design Conference</td>
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<tr>
<td>IPD</td>
<td>Integrated Product Design</td>
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<tr>
<td>IQA</td>
<td>Internal Quality Assurance</td>
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<tr>
<td>KTH</td>
<td>Royal Institute of Technology, Stockholm, Sweden</td>
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<tr>
<td>MSc</td>
<td>Master of Science</td>
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<tr>
<td>NVAO</td>
<td>Accreditation Organisation of the Netherlands and Flanders</td>
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<tr>
<td>PhD</td>
<td>Doctor of Philosophy</td>
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<tr>
<td>PLE</td>
<td>Project-led Education</td>
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<td>QANU</td>
<td>Quality Assurance Netherlands Universities</td>
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<tr>
<td>OKIO</td>
<td>Industrial Design Engineering Teaching Committee</td>
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<td>OWIS</td>
<td>Education Information System</td>
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<tr>
<td>R&amp;O</td>
<td>Staff appraisal at Delft University of Technology</td>
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<tr>
<td>SE</td>
<td>Self-evaluation</td>
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<tr>
<td>SER</td>
<td>Self-evaluation Report</td>
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<td>SPD</td>
<td>Strategic Product Design</td>
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<tr>
<td>StudyWeb</td>
<td>Eindhoven University of Technology electronic learning environment</td>
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<tr>
<td>Teletop</td>
<td>Twente University electronic learning environment</td>
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<tr>
<td>TNO</td>
<td>The Dutch Organisation for Applied Natural Scientific Research</td>
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<tr>
<td>TU Delft</td>
<td>Delft University of Technology</td>
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<tr>
<td>TU/e</td>
<td>Eindhoven University of Technology</td>
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</tbody>
</table>
ud  Assistant professor
uhd  Associate professor
UT  The University of Twente
VSNU  Association of Dutch universities
vwo  Pre-university education
wo  Academic Education
WO-monitor  Evaluation instrument for university ‘outcome’ (performance of graduates)