

Aerospace Engineering TU Delft

Assessment report

8 oktober 2025



Inhoud

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1. SUMMARY

This document reports on the programme assessment of the bachelor's and master's programme Aerospace Engineering, offered by TU Delft.

The bachelor's and master's programmes in Aerospace Engineering at TU Delft are unique within the Netherlands and internationally recognised. Both programmes aim to educate T-shaped professionals with a broad foundation in aerospace engineering and in-depth knowledge in a specialised domain. The intended learning outcomes of both programmes are clearly formulated and aligned with international higher education standards and frameworks for aerospace education.

The panel finds the intended learning outcomes to be well-structured, relevant, and sufficiently ambitious, reflecting the needs of the international aerospace sector. The active involvement of the Advisory Council, which includes professionals from industry and research, helps ensure that the learning outcomes of both programmes stay aligned with current developments in the field. The panel also appreciates the programmes' strong emphasis on interdisciplinary collaboration, international orientation, and the social and ethical context of technology.

The bachelor curriculum is based on three core qualities: fundamental, coherent and challenging. Students learn the foundations of mathematics, physics, engineering sciences, and the design process, all within the context of aerospace technology. They receive a broad education, both in terms of subject-specific knowledge as well as academic and engineering skills. Working on aerospace design projects is a key part of the curriculum. During the projects, students learn to apply their knowledge and the design process within the specific, multidisciplinary context of real aviation and aerospace projects. In addition, students develop personal and interpersonal skills in the design projects.

The master curriculum builds on the strong scientific foundation laid in the bachelor and focuses on deepening subject-specific expertise within one of five specialisation tracks: Aerodynamics & Wind Energy, Control & Operations, Space, Aerospace Structures & Materials, and Flight Performance & Propulsion. The master's programme is highly research-oriented and closely connected to the international aerospace sector. In the first year, students follow in-depth courses tailored to their chosen track, providing a strong foundation in their area of specialisation. In the second year, students choose either an internship, a joint interdisciplinary project, or a venture development course, to gain practical experience. The programme culminates in an individual master's thesis project, during which students conduct in-depth research or a design project within their specialisation.

The educational approach is characterised by interactive, project-based learning formats such as flipped classrooms, seminars, and hands-on laboratories. The bachelor's programme, through its project education, not only fosters domain knowledge but also important transferable skills such as teamwork, conflict management, intercultural collaboration, and addressing sustainability challenges, though, according to the panel, these skills could be more explicitly integrated into the learning objectives and assessment. The master's programme deepens students' expertise through small-scale, research-driven projects and internships.

TU Delft offers excellent facilities, including dedicated project spaces and advanced experimental laboratories. The programmes are fully taught in English, supporting their international focus and attracting a diverse student and staff body. Admission procedures are selective and rigorous, including a numerus fixus for the bachelor and a MSc Placement Test for the master. Although the proportion of female students is gradually increasing, it remains an area for continued attention. The faculty team is highly qualified and engaged, supported by Teaching Assistants who enhance undergraduate supervision.

Both programmes employ a robust assessment policy. A variety of formative and summative assessment methods are used, aligned with learning goals and supportive of student learning. The panel particularly appreciates the rigorous and transparent assessment procedures for the bachelor capstone project and master thesis project. It recommends further standardisation of logbook use to improve clarity on individual student contributions. The Board of Examiners plays an active and visible role in safeguarding the quality of assessment and the final attainment level. The panel is positive about the expertise and engagement of the Board, which takes its statutory responsibilities seriously and maintains a clear overview of both the curriculum and assessment.

Regarding the achieved learning outcomes, the panel concludes that graduates of both programmes exceed the intended final qualifications. Bachelor students demonstrate the ability to independently acquire and apply knowledge, analyse complex problems, and deliver multidisciplinary aerospace designs within professional teams. Master graduates are capable of analysing, designing, and realising complex technical systems, conducting independent research, and functioning effectively in international Research & Development environments.

The professional field and alumni highly value the project-based approach of the bachelor's programme and acknowledge the strong analytical, conceptual, and collaborative skills of graduates. Alumni confirm that their acquired knowledge and competencies are immediately applicable in professional practice. The faculty maintains strong ties with alumni through mentorship programmes, international chapters, and networking events, enhancing programme quality and relevance.

Hence, the panel issues a positive recommendation to the NVAO for the accreditation of the bachelor's and master's programme Aerospace Engineering, at TU Delft.

The chair and the secretary of the panel hereby declare that all members of the panel have studied this report and that they agree with the judgements laid down in the report. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Utrecht, 8 oktober 2025

Geert Dewulf
(chair)

Yvet Blom
(secretary)

2. INTRODUCTION

Procedure

Delft University of Technology (hereinafter: TU Delft) assigned Odion Onderzoek to perform the quality assessment of the bachelor's and master's programme Aerospace Engineering. The assessment was performed according to the four standards of the 2024 NVAO assessment framework for limited programme assessment.

The programme composed a panel of peers that performed the underlying assessment:

- Geert Dewulf (chair), Pro-Vice-Chancellor for Engineering and Physical Sciences, Queen's University Belfast
- Andreas Bardenhagen (panel member), Full Professor, Head of Chair of Aircraft Design and Aerostructures, Institute of Aeronautics and Astronautics, Technische Universität Berlin
- Gunnar Tibert (panel member), Associate Professor in Space Technology and Director of BSc and MSc education at the School of Engineering Sciences at KTH Royal Institute of Technology, Stockholm, Sweden
- Franco Bernelli Zazzera (panel member), Full Professor in Aerospace Systems and Delegate for International Relations of the School of Industrial and Information Engineering at Politecnico di Milano, Italy
- Gunnar Tibert (panel member), Associate Professor in Space Technology and Director of BSc and MSc education at the School of Engineering Sciences at KTH Royal Institute of Technology, Stockholm, Sweden.
- Hannah van Egmond (student-member), master student Industrial and Applied Mathematics and Science Education at Technical University Eindhoven.

The panel was supported by Yvet Blom, who acted as secretary. She has extensive experience as NVAO-certified secretary. The Odion Onderzoek project managers were Suzanne den Tuinder and Alexandra Paffen.

The composition of the panel and secretary was approved by the NVAO. On 20 February 2025, the chair received training from the project manager on the 2024 NVAO assessment framework, the tasks and working methods of the assessment panel, and specifically the chair's role within it. The panel members were instructed and informed about the assessment framework and procedure prior to and during the preparatory meeting by the chair and secretary. The panel members and secretary all signed a declaration of independence.

In preparation for the site visit, the panel reviewed the self-evaluation report prepared by TU Delft, along with several supporting documents made available online. TU Delft also provided the panel with a digital selection of theses. This selection included 15 final bachelor capstone projects, and 15 master's theses

with their corresponding assessment forms. The selection was based on a list of graduates from the period 2022–2024 and reflected a range of topics and tracks, as well as a diversity of examiners. The selection was compiled by TU Delft and approved by the chair. A full list of the documents reviewed by the panel can be found in Annex 3.

Prior to the site visit, all but one panel member shared their first impressions with the secretary. The secretary made a compilation of these first impressions and shared it with the panel members. One member, who joined two weeks before the visit, was subsequently updated.

During a preparatory meeting on 27 May 2025 the panel discussed their first impressions and identified key topics for further exploration. On 12 and 13 June 2025, the panel conducted the site visit at TU Delft. During this visit, the panel held interviews with management, teaching staff, committee members, students, alumni, and representatives from the professional field. Additionally, the panel visited the institution's facilities.

As required by the NVAO assessment framework, TU Delft staff and students were given the opportunity to address and discuss issues with the panel in confidence. They were notified via internal newsletter and the electronic learning environment by TU Delft. In order to address an issue, staff and students were asked to contact the secretary prior to the site visit. During the site visit an 'open hour' was scheduled to allow for the panel to meet with staff/students who responded. In the present programme assessment, no responses were received and so no meetings were held during the open hour.

At the end of the site visit the panel issued an assessment on the programme according to the four standards of the NVAO assessment framework for limited programme assessment. The panel assessed the programme in an independent manner. At the end of the visit, the chair publicly presented the panel's preliminary findings and general observations.

The programme of the site visit is described in Annex 2.

The underlying report contains a systematic presentation of the panel's findings, considerations and conclusions according to the NVAO assessment framework for limited programme assessment. A draft version of the report was prepared by the secretary after the site visit and was sent to the panel members for comments. The draft report was then edited based on the panel's comments and subsequently endorsed by the chair. Thereafter, the report was sent to TU Delft for a review on any factual inaccuracies. Upon their response, this report has been finalised and endorsed by the chair.

Institution

TU Delft was founded in 1842 and is the oldest technical university in the Netherlands. With over 25,000 students and 6,000 employees, it is also the largest. TU Delft has eight faculties offering bachelor's, master's and PhD programmes in fields such as aerospace engineering, civil engineering, mechanical engineering, electrical engineering and computer science. Together, these faculties offer nearly forty

technical-scientific disciplines and associated specialisations. In addition, TU Delft has two research institutes, QuTech and the TU Delft Reactor Institute.

The Faculty of Aerospace Engineering is one of the eight faculties at TU Delft. The faculty strives to achieve a leading international position as a “world-class faculty of Aerospace Engineering, renowned for modern teaching practices, high-profile research, hyper-modern laboratories and facilities, and pioneering innovations”. The faculty offers three programmes: a bachelor's, a master's and a doctoral education programme. High-profile research is conducted by the faculty's four research departments: Flow Physics and Technology, Space, Aerospace Structures & Materials, and Control & Operations.

With its education and research, the faculty contributes to the development of aerospace engineering. It educates innovative and solution-oriented engineers and develops new technologies and groundbreaking innovations. The faculty has close ties with industry, government organisations and leading national and international research institutes. Technical and social issues relating to the design, engineering and use of aerospace vehicles form the core of its education and research. Students receive high-quality education and develop an interdisciplinary perspective right from the start of their studies: an awareness that collaboration with non-technical disciplines is essential for the development of technological innovations. Students at the faculty grow into high-quality engineers who are creative, innovative and responsible.

Programmes

The bachelor's programme in Aerospace Engineering is a three-year, English-taught programme (180 EC) focused on broad academic training in aerospace engineering. Students acquire foundational knowledge in mathematics, physics, engineering sciences and the engineering design process. The programme is project-oriented: each semester, students work on aerospace design projects in which they integrate, apply and deepen their subject-specific knowledge. During these projects, students develop skills to design and integrate systems based on mission requirements as well as to acquire personal and interpersonal skills. The design projects form the prelude to the final Design Synthesis Project (the bachelor capstone project). The programme provides a solid foundation for further specialisation and a career in an innovative, international sector. Due to high demand, a numerus fixus has been in place since 2012. Each year, 440 students are selected through this procedure. The number of applicants increases annually; in 2024, for example, over 3,400 students applied.

The master's programme in Aerospace Engineering is a two-year, English-language programme (120 EC) with five specialisation tracks: Aerodynamics & Wind Energy, Control & Operations, Space, Aerospace Structures & Materials, and Flight Performance & Propulsion. During the specialisation, students deepen their professional knowledge, work on research questions, and develop technological innovations. The master's programme is highly research-oriented and closely connected to the (international) aerospace sector. There is intensive collaboration with organisations such as the European Space Agency (ESA), Airbus and Netherlands Aerospace Centre (NLR). Graduates of the master's programme in Aerospace Engineering are able to design and engineer complex systems and machines, including aircraft and spacecraft. In addition, they have the expertise to meet the demands of contemporary technology and engineering. Besides careers in the aviation and aerospace sector, some alumni choose careers in

business development and information technology. The master's programme also provides a solid foundation for the doctoral education programme (PhD).

The administrative data on the programme and the institution are provided in Annex 1 to this report.

Developments since the previous accreditation

The programmes were previously accredited in October 2019. Their assessments were positive. The assessment report from 2019 contains several recommendations of the panel at that time. The present panel checked how these recommendations were followed up by the programmes. It notes that all recommendations have been adequately followed up, as is shown in the following overview:

Recommendation BSc	Improvement
<p>The programme is challenging for the students, reflected by the fact that despite a competitive selection procedure, still a considerable proportion of the first-year students do not achieve the BSA requirements</p>	<p>Since the previous visitation the pass rates have gone up considerably. During the period in which the world was struggling with the COVID-19 pandemic there was a dip visible. Since then, the upgoing trend has been reestablished. The number of students that pass the BSA has gone up significantly. In addition, by now the pass rate for the complete program, often expressed as the “Bachelor in 4 years”, is one of the highest in the university.</p>
<p>The panel recommends explicitly describing ethics in the learning goals and content of courses.</p> <p>Ethics and scientific integrity are one of the ILOs which should necessarily be covered in the bachelor program, according to the panel, before students start to do research. It noticed that there is no dedicated course on ethics scheduled. The students and lecturers assured the panel that scientific integrity is covered in several courses and design projects in the bachelor curriculum, but they admit that it is not always visible. The panel recommends explicitly describing ethics in the learning goals and in the content of the respective courses.</p>	<p>The current bachelor programme has no dedicated course on ethics. The Master programme has a mandatory ethics course. The faculty did some improvements. It has coordinated attention to ethics in various courses, but this is not explicitly visible in the program. To address that, in the update of the bachelor programme a learning line “Ethics and societal context” will be introduced as one of the four learning lines.</p>

<p>The panel advises to make sure that students are prepared for working in a group project before they start in the final Synthesis Capstone Project.</p> <p>The panel also recommends the training of students in peer-feedback at an earlier stage of their study programme. If students are confident in giving each other feedback, they will maximally benefit from this activity lead by their peers.</p> <p>The panel speculates that this might stem from the fact that, although an elaborate individual grading system is used, the final grade of individual group members is often not far from the group grade. This might lead to the perception of imbalance. The panel recommends the programme to investigate whether this is the case, and if this is the case, find a suitable solution that makes the grading more transparent to students.</p>	<p>In all projects in year 1 and 2 of the bachelor program, peer- and self-evaluation has been introduced.</p> <p>The organising committee for the capstone project has thoroughly analysed the outcomes of the grading. Indeed, the spread in the grades is not that large. The faculty sees different reasons for this. Since this is a group work the “stronger” students will uplift the “weaker” students in the group. Likewise, the “weaker” students in the group will, to a certain extent, have a negative influence on the work of the “stronger” ones. In addition to that the large number of aspects graded will also lead to a smaller spread in the grades.</p> <p>Since the previous assessment the coordinating committee has removed some of the less distinguishing aspects of the grading. On the other hand, since this is the capstone project in which many things come together it is fair to take them into account in the grading. The students are informed about the grading process and all aspects taken into account before the exercise starts.</p> <p>Finally, the TU Delft system for publishing the grades requires the grades to be rounded to the nearest 0.5. During the grading sessions the students will also be informed about their unrounded grade.</p>
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<p>The panel advises paying attention to the training and selection of teaching assistants to make sure that their teaching qualities and personal guidance skills when acting as a mentor are equivalent.</p> <p>In particular, the bachelor students are guided and instructed by many teaching assistants; the panel advises paying attention to the training and selection of these assistants to make sure that their teaching qualities and personal guidance skills are adequate and equivalent.</p>	<p>Since the previous visitation the faculty has set up a training programme for all teaching assistants that teach and mentor in the first year project. For this there is a centrally organised training program. In addition to that there are several modules in development within the faculty in the field of intercultural aspects, social safety and inclusiveness. Of course, this is supplemented with content-based training for the course of project at hand.</p> <p>Furthermore, there is an active exchange between staff members when selecting teaching assistants for their projects and courses. In that way they can exchange their experience with teaching assistants and select the ones that do best in their work. Usually there are more than enough applications for the positions available. There is also a common practice to re-appoint at least a few teaching assistants that have been assisting in the course in the previous year.</p>
<p>The panel noticed a shortage in support staff. It recommends investigating which coaching and counselling tasks can be done by support staff and giving priority to filling vacancies in support staff and even considering increasing the FTE dedicated to the support staff in order not to further increase the workload of the faculty.</p>	<p>With the help of different funding schemes made available since the previous visitation the faculty has been able to increase its staff considerably. Funding schemes used were “Wet Studievoorschotmiddelen (WSV)”, “Van Rijn” and “Sector plan 1” and “Sector plan 2”. The first two were specifically education focussed. The last two were more research focussed but also hold an educational component. They are also required to spend some of their time on education. The student-to-staff ratio has improved considerably since 2019. In 2019 the student-to-staff ratio was 27:1. Now it is 22:1.</p>

Recommendation MSc	Improvement
<p>The panel is of the opinion that the programme is responsible for making it possible to finish the master in two years and therefore recommends the faculty to pay special attention to the position of foreign students in regard to the planning of internships. It recommends reconsidering the scheduling of the internship in order to make this more flexible. International students meet several obstacles in finding an internship place. They lack a network in the Netherlands and, partly for financial reasons, have fewer opportunities to take more time to finish their master's programme. It recommends to increase the number of internships facilitated, to make sure that foreign students can do an internship to avoid study delay, reconsider the scheduling and make the position of the internship more flexible .</p>	<p>The faculty has studied the impact of the internship on the total study delay and found it to be significant, but proportional to its size in the educational programme. The internship has been reduced in size from minimum 12 to a minimum of 10 weeks which will likely somewhat reduce the effect on duration of the study programme. To increase flexibility during COVID the internship could be taken at the end of the programme, and this possibility has been continued and is now formalized. The number of internships is mostly out of the control of the faculty as it depends on availability and budgets at the many institutes and companies where our students do internships. Students now have the option to choose an alternative activity. Instead of an internship there is the possibility to either take part in a Joint Interdisciplinary Project (JIP) of a venture development course. These options are there such that students who have difficulty finding an internship have a suitable alternative.</p>
<p>It should be noted that the student success rates after two years remain very low. The panel advises to have sufficient attention for this fact and take measures to improve these success rates.</p>	<p>A study of the study delay made clear that it manifests through all aspects of the programme and starts from day 1. That makes clear that there are many factors that contribute to the low success rate. The choice has been made to focus first on reducing duration of the MSc thesis as the largest component in the programme and is also the largest contributor to the study delay as has been detailed at several places in this report. With the regulation, the thesis duration should be limited to the nominal duration which is a significant improvement compared to the situation before with on average 5 months delay. A further effort is a priority for the education management team.</p>

<p>The workload of the teaching staff is very high, however. The panel noticed a shortage of support staff. It recommends investigating which coaching and counselling tasks can be done by support staff and giving priority to filling vacancies in the support staff.</p>	<p>With the help of different funding schemes made available since the previous visitation the faculty has been able to increase its staff considerably. Funding schemes used were “Wet Studievoorschotmiddelen (WSV)”, “Van Rijn” and “Sector plan 1” and “Sector plan 2”. The first two were specifically education focussed. The last two were more research focussed but also hold an educational component. The support staff developed accordingly. The same holds for the number of PhD candidates. They are also required to spend some of their time on education. The student-to-staff ratio has improved considerably since 2019. In 2019 the student-to-staff ratio was 27:1. Now it is 22:1.</p>
<p>The assessment of the internship in the master’s programme is adequate in its opinion, but it recommends checking its quality from the start of the project and at the midterm review through personal contact between the academic supervisor, the external supervisor and the student for each internship.</p>	<p>This has only been partially achieved. Due to high workload and the world wide spread of internship positions it has proven to be impossible to establish personal contacts between the internship coordinator, the external supervisor and the academic supervisor. What has been done is that an extensive survey on the performance of the student is completed by the external supervisor and is considered in the assessment by the academic staff member who assesses the internship report.</p>
<p>The assessment procedure for the master’s thesis project is very well developed in the panel’s opinion. It noted, however, that improvement is possible in the use of the rubrics on the assessment forms. It studied a selection of 15 master’s theses. In general, it agreed with the assessment and the grading given, although it would have graded some theses lower than the graduation committee; this difference could have resulted from the lack of feedback on the forms. It would welcome more argumentation for the rubric scores and more written feedback to students.</p>	<p>The rubrics have been changed as described in this report, but the assessment forms have not been changed. As part of the reduction in study duration the role of the mid-term review has been strengthened and feedback by the supervisors now has to be recorded. As a side effect of limiting the duration of the MSc thesis, it is expected that grades will be reduced, because students and supervisors can no longer have the possibility to extend the work on the thesis to improve the quality and the grade.</p> <p>Feedback to the students is always given orally to the student after the grade is given. The students’ wish for more written feedback is recognized and is looked at together with revision of the procedure of the defence that is currently being undertaken.</p>

3. PROGRAMME ASSESSMENT

Standard 1: intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Findings

The bachelor's and master's programmes in Aerospace Engineering at TU Delft's Faculty of Aerospace Engineering are unique in the Netherlands and rank among the world's leading programmes in the aerospace sector. Both programmes aim to educate engineers to become so-called T-shaped professionals: graduates with a broad technical foundation in aerospace engineering and fundamental sciences, combined with in-depth specialist knowledge within a specific domain of the design, engineering or operational application of aircraft, spacecraft or rockets. T-shaped professionals possess skills in systems thinking, problem analysis, critical reasoning, communication and collaboration. They are able to perform complex tasks in interdisciplinary and intercultural teams, taking into account the social and ethical context in which technological innovations take place.

In the bachelor's phase, students develop a broad foundation (the horizontal bar of the letter T), consisting of mathematics, physics, engineering sciences, and the engineering design process. Students also develop personal and interpersonal skills and learn to collaborate effectively. In the master's phase, specialisation takes place (the vertical bar of the letter T) within one of the following five tracks: Aerodynamics & Wind Energy, Control & Operations, Space, Aerospace Structures & Materials, Flight Performance & Propulsion.

Graduates are able to analyse, design and develop complex technical systems in interdisciplinary and intercultural environments. Besides a career in the aviation and aerospace sector, the graduates are also attractive to other businesses and industries. The master's programme also provides a solid foundation for the doctoral education programme.

Final qualifications

The Faculty of Aerospace Engineering has formulated clear final qualifications for both the bachelor's and master's programmes (see annex 4). The final qualifications are based on the 4TU Criteria for Academic Bachelor's and Master's Curricula (the so-called Meijers criteria). The Meijers Criteria consist of seven competency areas developed by the partnership of the four technical universities in the Netherlands (4TU.Federation). The seven competency areas relate to knowledge, skills and attitude. The criteria are recognised by the NVAO and are in line with the Dublin descriptors. The criteria are as follows:

A university graduate should:

1. Be competent in the domain of aerospace engineering sciences
2. Be competent in research
3. Be competent in design

4. Be able to follow a scientific approach
5. Be able to apply basic intellectual skills
6. Be competent in cooperating and communicating
7. Consider the temporal and societal context

Bachelor

The Faculty of Aerospace Engineering has translated the seven competency areas from the Meijers Criteria into specifically formulated final qualifications (4 to 7 per competency area, 42 in total). These final qualifications are formulated in such a way that they are generic as well as specific enough to remain relevant and applicable in the aerospace sector. The first competency area of the Meijers Criteria, 'Be competent in the domain of aerospace engineering sciences', includes fifteen subject areas that indicate the broad scope of the bachelor's programme: mathematics, thermodynamics, electromagnetism, fluid mechanics, aerodynamics, solid mechanics, flight mechanics, propulsion, materials science & aircraft structures, systems & control engineering, design of aircraft, spacecraft & rockets, astrodynamics, space science, information technology, and management, economics & communication.

The final qualifications of the bachelor's programme are aligned with the NLQF and EQF frameworks at level 6. In addition, they are consistent with the international CDIO syllabus (Conceive–Design–Implement–Operate), an international educational framework for undergraduate engineering programmes, which describes the knowledge, skills and attitudes that graduate engineers must master. The final qualifications also meet the criteria of the PEGASUS network, the European partnership of leading aerospace universities. The PEGASUS criteria were formulated by a network of European aerospace universities with the aim of ensuring the quality and international co-operation of aerospace studies.

Master

The final qualifications of the master's programme in Aerospace Engineering, like those of the bachelor's programme, are also based on the seven competency areas from the Meijers Criteria. For each of the seven competency areas, 5 to 8 final qualifications have been formulated, resulting in a total of 49 final qualifications. The domain-specific competency area "Be competent in the domain of aerospace engineering sciences" is detailed in eight subject-specific areas of knowledge:

- Basic engineering sciences
- Aerodynamics
- Flight and orbital mechanics
- Aircraft and rocket propulsion
- Aerospace materials and structures
- Design of aircraft spacecraft and rockets
- Systems and control engineering
- Management and economics

These subjects are derived from the domain-specific reference framework, which was compiled by a diverse group of representatives from the aerospace sector. The remaining six areas of competence have been specified in final qualifications that focus on the academic and professional development of

students. The final qualifications of the master's programme are aligned with the NLQF and EQF frameworks at level 7. Beyond these frameworks, they also meet the accreditation requirements of ABET (Accreditation Board for Engineering and Technology) and comply with the PEGASUS criteria. The final qualifications apply to each of the five master's tracks.

Until 2024-2025, the Master's programme offered a joint master's track in collaboration with the Technical University of Denmark (DTU): the European Wind Energy Master (EWEM). This track gave students the option to graduate from two programmes and thus receive two degrees from both TU Delft and DTU. Due to stricter regulations surrounding joint degrees, TU Delft has decided to discontinue offering the joint degree. Students can still specialise in wind energy through alternative routes (e.g. via a 30 EC minor in the bachelor programme and a dedicated profile in the master programme) including exchange programmes.

Industry

The faculty maintains strong connections with industry through its Advisory Council. The Advisory Council, comprising around twenty representatives from national and international companies, research institutes, airlines, and agencies (including the European Space Agency), meets twice a year. The Council gives strategic advice on relevant trends and developments within the aerospace field and advises on curriculum updates. Besides, during the site visit it became very clear that the Faculty has very strong links with the industry through collaborative research project and involvement of the industry in student projects and challenges.

During the site visit, the panel spoke with members of the Advisory Council. They expressed their admiration for the solid theoretical foundation and strong collaborative skills students acquire during the bachelor's programme. Students develop a comprehensive understanding of Aerospace Engineering and learn to apply this knowledge effectively in project-based education (see standard 2). The master's programme is more individually focused and gives students the opportunity to specialise within the extensive field of Aerospace Engineering.

The members of the Advisory Council consider the collaboration with the Faculty of Aerospace Engineering to be valuable and informed the panel that the faculty follows up on their recommendations appropriately. Examples of implemented advice include strengthening the bachelor's and master's programmes with respect to digital literacy, particularly in the areas of digital electronics and software in cyber-physical systems. The Advisory Council is actively involved in curriculum development and has contributed to recent and upcoming revisions in both the bachelor's and the master's programme (see standard 2). In addition to its advisory role, the Council contributes to the faculty's educational activities by offering internships and practical assignments. These opportunities are provided by a wide range of companies, not limited to those represented on the Advisory Council. Council members expressed interest in playing an even more active role in the educational programme, for example by delivering guest lectures, thereby further enriching students' learning experiences.

Considerations

The panel acknowledges that the Faculty of Aerospace Engineering offers a unique bachelor's and master's programme in Aerospace Engineering. The final qualifications of both programmes are based on the Meijers Criteria. The final qualifications of the bachelor's programme are in line with the

international CDIO syllabus for engineering undergraduate programmes and with the PEGASUS network criteria. The master's programme consists of five tracks, each based on the same final qualifications, which meet the accreditation requirements of ABET and the PEGASUS criteria.

The panel has reviewed the level of the final qualifications for the bachelor's and master's programmes and concludes that they meet the Dublin descriptors based on the Meijers Criteria. The final qualifications are also in line with the NLQF and EQF frameworks: level 6 for the bachelor's programme and level 7 for the master's programme.

The panel values the faculty's clear focus on educating T-shaped professionals and appreciates how this focus is embedded throughout the curriculum. Professionals who have both a broad foundation in aerospace engineering and in-depth expertise within a specific aerospace engineering domain. These professionals are able to tackle complex issues within interdisciplinary and international teams, while being aware of the social and ethical context in which technological innovations are developed.

The panel is also positive about the close and effective cooperation with industry. The Advisory Council provides the faculty with strategic advice and ensures that the final qualifications remain up to date and relevant. The faculty is open to substantive feedback and translates advice into adjustments or policy choices to the satisfaction of the Advisory Council. In addition to strategic advice, the Council, as well as a wide range of companies, provides the faculty with practical assignments and internships.

Conclusion

Based on the interviews and examination of the underlying documentation, the panel concludes that the programme **meets standard 1**, intended learning outcomes.

Standard 2: teaching-learning environment

The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Findings

Bachelor

The bachelor in Aerospace Engineering is a three-year English-taught programme (180 EC), consisting of two semesters per year, each divided into two ten-week teaching blocks (quarters). The programme is divided into two phases: the major phase (150 EC) and the minor phase (30 EC). The major consists of a fixed curriculum with mandatory courses, practicals and projects. The minor focuses on broadening or deepening knowledge.

The programme is logically structured in terms of complexity and autonomy, using three continuous learning lines and five themes. Each learning line consists of a set of courses, practicals and/or projects with learning objectives derived from the final qualifications of the bachelor. The three continuous learning lines are: 1. aerospace design, 2. aerospace engineering and technology, and 3. basic engineering sciences. The first learning line, aerospace design, consists of one module per semester with two course components: a design project and a corresponding engineering design course. The second learning line, aerospace engineering and technology, consists of theoretical courses within the aerospace

domain. Finally, the third, basic engineering sciences, focuses on developing basic knowledge in mathematics, programming and physics. Each semester (with the exception of the minor phase in the fifth semester) focuses on a theme from the five consecutive phases of the engineering process life cycle: exploration, conceptual design, detailed design, analysis & simulation, verification & validation. To support the quality of education, each course is taught by two lecturers: a course coordinator and a buddy or satellite.

Bachelor curriculum

The curriculum (see Annex 5 for the full curriculum) is based on three core qualities: fundamental, coherent and challenging. In the first year, approximately half of the programme consists of foundation courses such as mathematics, physics and programming skills. These form the basis for the more subject-specific components in the following years. The other half of the first year focuses on acquiring knowledge of aerospace engineering and design, and on developing academic, personal, and interpersonal skills. In the second year, students delve deeper into the subject matter. Approximately 30% of the programme consists of advanced foundation courses; approximately 65% focuses on the various sub-disciplines of aerospace engineering, such as aerodynamics, flight and orbital mechanics, propulsion, systems and control engineering, aerospace structures, design, and research skills. The remaining 5% is focused on developing personal and interpersonal skills.

The third year starts with the minor in the fifth semester. Minors give students the opportunity to broaden or deepen their knowledge within a domain of their choice. Students can choose from a wide range of minors within TUD and at other universities in the Netherlands and abroad. The Faculty of Aerospace Engineering encourages students to develop into T-shaped professionals and encourages them to explore sectors outside the aerospace domain. The faculty itself offers three minors: Offshore Wind Energy, Airport Development (formerly Airport of the Future) and Space Missions (in collaboration with Leiden University). The three minors have a total capacity of 170 students. The faculty also facilitates minors abroad. Currently, approximately 130 students are following a minor abroad. Between 5% and 10% of students choose to put together their own minor. It is up to the Board of Examiners to approve such a self-composed minor.

Due to the growing student population at TU Delft, the annual demand for minor spots (approx. 300 students) exceeds the available capacity (about 250 spots). During discussions with management, lecturers, and students, the panel asked to what extent students are affected by the limited capacity. It became apparent during these discussions that capacity does not pose a problem. Students are resourceful and are able to find minor places independently at other faculties and universities.

The final semester of the bachelor's programme (year 3) consists of two courses: Flight Dynamics, Production of Aircraft and Spacecraft, and Aerospace Systems Engineering in quarter 3, and the Design Synthesis Exercise (DSE) in quarter 4. The DSE is the capstone project of the bachelor and integrates the knowledge and skills that students have acquired in the previous years. The conceptualisation and design of an aircraft or spacecraft (airplane, satellite, rocket) form the core of the DSE. Working in self-governing teams of approximately ten students. Students spend ten weeks full-time completing all five phases of the design cycle as covered in the previous design courses. Each team, working in dedicated project spaces, tackles a unique challenge: either a design problem or an original research design question

related to vehicle or mission design. Within the design projects, students depend on each other to complete assignments. This dependence appears to have a motivating effect. Students learn from each other and encourage their fellow students to contribute to the project.

DSE-project teams are supported by a principal tutor and two coaches. Project topics are tailored by tutors using a standardised format and span a wide range of aerospace challenges. To ensure relevance and feasibility, all projects are screened in advance by two independent industry professionals. In the project, students act in the professional capacity of technical specialists. They apply systems analysis techniques and show they can independently acquire the knowledge needed to solve the design problem. They are also expected to take on organisational roles within the team, dividing responsibilities among themselves, and communicate effectively with both fellow students and aerospace professionals about the design and its process.

Students indicated that they were generally very satisfied with the structure and design of the curriculum. However, they did raise concerns about the Programming & Scientific Computing in Python course (2 EC). It is the only course in which students explicitly practise programming. Students with prior knowledge or affinity for programming find a 2 EC course sufficient, but for students without prior knowledge, this course is a hurdle. They are unable to develop the necessary programming skills sufficiently with 2 EC and encounter difficulties in later years because they are unable to apply their programming skills. The course is adapted to the level of the students, which students appreciate, but this approach at the same time maintains the knowledge gap between those with and without prior programming experience. The same discussion also revealed that the programming course is currently offered in quarter 4 of the first year. Students indicated that it would make more sense and be more effective to include this course in quarter 1 or 2 of the first year, as programming skills are essential for the rest of the programme. They also expressed a desire to learn how to work with GitHub, a platform for software development and version control, which is relevant for carrying out later projects.

Students further mentioned a desire for greater emphasis on topics such as space engineering, the UN Sustainable Development Goals, and management and business economics. These suggestions will be taken into account in the upcoming revision of the bachelor's programme.

The current bachelor curriculum was introduced in 2009 and is currently under revision. The updated curriculum is scheduled to be implemented in September 2026.

Master

The master's in Aerospace Engineering is a two-year English-taught programme (120 EC) and divided into four semesters. Each semester consists of two ten-week blocks (quarters). The master's programme focuses on deepening subject-specific knowledge with five specialisation tracks: five specialisation tracks: Aerodynamics & Wind Energy, Control & Operations, Space, Aerospace Structures & Materials, and Flight Performance & Propulsion. The five tracks are offered by the four research departments of the Faculty of Aerospace Engineering: Control & Operations, Space, Aerospace Structures & Materials, and Flow Physics and Technology. This last research department is responsible for two tracks: Aerodynamics & Wind Energy and Flight Performance & Propulsion. The five tracks are divided into two to three profiles (twelve in total), and each profile is linked to a research group.

Master curriculum

The first year of the master (see Annex 5 for the full curriculum) consists of core courses, profile-specific courses and electives (60 ECTS). The core courses are a mandatory part of the curriculum (10 to 14 EC, depending on the track) and provide a strong foundation for knowledge about the track. In addition, the core courses help students with different educational backgrounds to achieve the same level of knowledge of the track's theme, preparing every student for the more specialised parts of the programme. All tracks include one common core course: Ethics for Aerospace Engineers (3 EC). This course focuses on personal integrity and awareness of the technical and social implications of the field.

The profile-specific courses (8 to 20 EC) provide in-depth knowledge within the chosen track and enable students to develop into T-shaped professionals. These courses offer the opportunity to build in-depth knowledge and expertise within a subdiscipline of aerospace engineering. Together, the core and profile specific courses have a study load of approximately 32 EC.

The elective courses offer students the opportunity to further shape their personal learning path. They can choose from two types of electives: (1) technical electives, aimed at further specialisation within a (sub)field, multidisciplinary broadening or strengthening basic knowledge; and (2) Professional and Personal Development courses (PPD), aimed at personal growth and professional skills. To put together a coherent programme, students can get support from the track coordinator, profile coordinator, or a lecturer with an overview of the entire track.

The second year of the master consists of two parts. Part 1 (15 EC) consists of either an internship, a Joint Interdisciplinary project, or a Technology Venture Development course. Internships last at least ten weeks and offer students the opportunity to acquire professional skills in a professional working environment. During the internship, students work at a company where they carry out a business assignment, investigate the organisation's alignment with professional standards such as sustainable development, and reflect on their own development and performance.

The Joint Interdisciplinary Project is a full-time group project in which students from various faculties collaborate on technological solutions for issues in the field of Research & Development, provided by partners from the aerospace industry or the government. The Technology Venture Development course focuses on developing entrepreneurial skills in an internship-like setting. Working in small teams (three to four students), students engage with start-ups to assess and challenge the business model and strategy, and provide advice on a specific business challenge. This process is supported by (guest) lectures and coaching sessions.

Part 2 consists of an individual in-depth research or design thesis project (45 EC) within the student's chosen profile. The project is usually part of a broader ongoing research or design project, requiring students to align their planning and contributions with the overarching project goals. The faculty aims to educate students to become independent researchers who can perform at a high level within the field of research and development. In addition, students develop skills in project planning, communication and academic or technical reporting.

During the panel discussions, students and alumni expressed their appreciation for the quality and structure of the master's curriculum. They are positive about the substantive coherence between the various courses and projects. The practical nature of the second year of the master's programme aligns well with students' need to gain practical experience. For many, the internship is the first opportunity to acquire professional skills in a professional context. Students and alumni experience the internship as a valuable learning experience that contributes to their professional growth and gives them insights into the type of workplace and employer which suits them best. Discussions with the professional field show that companies use the internship to identify and retain talent.

The master curriculum has been revised in the 2022-2023 academic year, known as the MSc Vitalisation. The revision has led to changes in the content, flexibility and structure of the programme. Since the revision, the master's programme is structured into three main components: 60 EC of core courses, profile-specific courses and electives, 15 EC for an internship or alternative project, and 45 EC of the graduation project.

Strong community

Bachelor and master students and staff form close-knit, academically-driven communities. These communities create a stimulating learning environment in which students are challenged to excel. An important contribution to the sense of community is made by the active study association, the Leonardo da Vinci Society of Aerospace Students (VSV). The VSV organises various activities, such as the pre-university introduction weekend for incoming bachelor students, national and international excursions, and symposiums and lectures with representatives from the aerospace engineering industry. According to students and staff, these activities strengthen the bonds between students and lecturers and contribute to a strong sense of community within the faculty.

The faculty also actively promotes connection and community spirit among master's students. Master's students start their programme with a Master's Kick-Off, during which staff members and senior students are available to answer questions and support newcomers with networking. A solid network makes it easier to connect with other students, find internships, and ultimately successfully complete the Master's programme. TU Delft also focuses on welcoming international students through a mandatory introduction programme before the start of the first semester, which participants consistently regard as valuable and supportive.

Teaching methods

The courses and projects in the bachelor's and master's programmes are engaging and consist of interactive lecturing techniques in lecture halls, active studio-classroom settings, flipped classrooms, seminars, and hands-on learning in labs. Students can follow online learning modules in the Brightspace online learning environment. These modules consist of tutorials that offer individual guidance.

Project-based education is key in the bachelor's programme in Aerospace Engineering. During the design projects, students learn to apply their theoretical knowledge and also develop skills such as project management, collaboration, communication and dealing with sustainability challenges. These non-technical skills form part of the final qualifications: Be competent in cooperating and communicating and consider the temporal and societal context, and are acquired by students through learning by doing. The

bachelor's programme does not link any explicit learning objectives, courses or workshops to these final qualifications.

The master's programme in Aerospace Engineering focuses on deepening and specialising knowledge by means of small-scale, research-driven education. Students work independently on complex assignments, internships and graduation projects. Students carry out research and assignments within the relevant research department of their chosen track, or in collaboration with external partners.

Facilities

During the site visit, the panel was given a tour that provided a good impression of the high-quality, state-of-the-art facilities available to the faculty. Lecture rooms for the bachelor's programme are available in both the faculty building and the specially designed teaching building, The Fellowship. The Fellowship is designed for project-based education and collaborative learning. The Faculty and Fellowship house the Collaborative Design Lab, project rooms, studio classrooms and study workspaces. In addition, in the faculty building there are well-equipped computer rooms and relevant engineering and programming software available.

Bachelor's and master's students make frequent use of the extensive experimental facilities of the Faculty of Aerospace Engineering. The faculty offers various wind tunnels (subsonic to supersonic), the Delft Aerospace Structures & Materials Lab, the SIMONA flight simulator and the Satellite Cleanroom. Bachelor's students can only use the facilities under supervision. Master's students, on the other hand, are allowed to use the facilities of the research departments alone or in small teams.

English programmes

The faculty has explained in detail in the information file why the bachelor's and master's programmes in Aerospace Engineering are taught in English and have English titles. The faculty initially offered the Aerospace programme (then a 5-year doctoral programme) in Dutch. In the 1990s, the faculty was advised by the then accreditation panel to switch to English in order to prepare students better for the international context in which they will work after graduation. At that time, the name of the programme was also changed to English.

During the site visit, the panel wanted to know if the decision to conduct the programme in English is still appropriate. In discussion with programme management, students, alumni, and representatives from industry, the panel found that the aerospace engineering sector operates on a highly international level. Multinational engineering and manufacturing companies, international airlines, and intergovernmental space agencies dominate the market. The faculty reflects the international nature of the sector by offering the programme entirely in English and by creating a balanced mix of Dutch and international students and staff members.

Honours programme

Both the bachelor's and master's programme offer an honours programme. The Honours Programme Bachelor consists of 20 EC and is intended for students who have completed their first year with an average grade of 8.0 or higher. A selected group of approximately twenty honours students follow the Honours Programme Bachelor alongside the regular programme. Students carry out an individual

research project within one of the faculty's research groups. Alternatively, they can also choose to set up an interdisciplinary project to broaden their academic and professional skills. The honours programme ends each year with a small-scale symposium where students present their results. In addition, honours students take one or more interdisciplinary modules and write a reflection report at the end of the programme. Approximately 80% of honours students successfully complete the Honours Programme Bachelor.

Excellent students who have completed their bachelor's degree within four years with an average grade of 7.5 or higher can participate in the Honours Programme Master (20 EC), which is followed alongside the regular programme. The Honours Programme Master is an individual, tailor-made programme that students put together with the honours coordinator. The programme can include, for example, an interdisciplinary project at another faculty or university, in the Netherlands or abroad, or an extra internship with a specific learning objective. Students who successfully complete the Honours Programme Master receive a certificate.

Bachelor admission

The bachelor's programme in Aerospace Engineering is open to students with a Dutch VWO diploma with a focus on Science & Technology or Science & Health, with Mathematics B and Physics as mandatory subjects. Students who have successfully completed the first year of a technical bachelor's programme of a university (of applied sciences) are also eligible for admission. Students aged 21 and older can also be admitted to the bachelor's programme by means of an entrance exam, regardless of their previous education.

Students are selected based on a ranking system that takes into account academic aptitude (40% weighing) and academic performance (60% weighting). All prospective students must complete the same three steps for admission. The first step consists of successfully completing mandatory assignments within a digital learning environment. The second step is a study motivation test and a personality test. These tests show how prospective students behave in study situations. The scores that students achieve for both tests together form the score for academic aptitude. The third step is also a test, a selection test. This test is designed to assess the academic skills of candidates, consisting of mathematics, physics, and first-year aerospace engineering course material. Every test is taken online. To prevent fraud, eye tracking, keystrokes and screenshots are used.

The number of applications has gradually increased significantly over the past twelve years, from 500 in 2013 to 3,406 in 2025. A significant proportion of these applications are from international students from all over the world. Partly because of its excellent reputation as well as the fact that the programme is offered entirely in English. Given the available facilities and staff capacity, the programme has a number of 440 students, a number that, according to management, can be accommodated and maintained.

Master admission

Admission to the master's programme in Aerospace Engineering is based on a standardised procedure that is the same for all candidates, regardless of their preferred track or background. Candidates are first screened by the university-wide Admission Office and then by two faculty members. Since 2016, the faculty uses the GRE (Graduate Record Examination) admission test.

The vast majority of master's students have completed a bachelor's degree at TU Delft, with over half coming directly from the bachelor's Aerospace Engineering programme. Less than 10% of students come from other Dutch universities. Similar to the bachelor's programme, the master's has seen a sharp increase in the number of applicants in recent years. The faculty has taken measures to continue to guarantee the quality of education, taking into account the capacity for thesis supervision and workload. Measures implemented by TU Delft include a stricter admission procedure, including the GRE, a maximum number of non-EEA candidates who can enrol (since 2019), and the introduction of the Master Track Placement Procedure (since 2022). The Placement Procedure ensures the careful placement of students (based on academic suitability and performance) in master's tracks if the capacity for a track is exceeded.

The desired target number for enrolment in the MSc programme is 480 students. For the 2024-2025 academic year, the maximum capacity for the Master's programme has been set at 575 students (the sum of the maximum capacity of the five tracks). If more students meet the admission criteria than the total capacity, the Dean, together with the faculty management team, will decide where and how the capacity in the tracks can be increased to ensure access for all students. The Faculty has started an internal discussion on installing a numerus fixus for the master program as well.

Diversity

The intake for both the bachelor's and master's programmes consists of a good mix of Dutch and international students. The large number of international students (more than 70% in the bachelor's programme and more than 50% in the master's programme) contributes to an international and intercultural learning environment that is highly valued by students, staff and future employers. The international learning environment is perfectly suited for the demands of the aerospace industry. The industry requires culturally agile engineers with a global mindset. International students are generally highly motivated and achieve higher results on average than Dutch students. The motivated attitude of a large group of students contributes to the ambitious academic culture of the faculty.

The faculty strives to increase the intake of female students. Although the percentage of women has risen slightly in recent years, it remains a priority for the faculty. For the 2024-2025 academic year, the faculty sought to reserve 30% of spots for female candidates who meet the admission criteria, but this was not permitted by the Education Inspectorate. TU Delft remains committed to its ambition of achieving an intake of 30% female students in the bachelor's programme by 2030. To enable this, the faculty is focusing its efforts on targeted information campaigns in primary and secondary schools.

Staff

During the site visit, the panel spoke with dedicated and knowledgeable professors, associate professors and lecturers from the Faculty of Aerospace Engineering. Nearly 95% of the permanent academic staff hold a PhD degree and are actively involved in one or more research programmes. The panel observed that all teaching staff possess a level of English proficiency adequate for delivering the programme in English. The faculty also utilises expertise from other faculties: for example, the mathematics courses in the first and second years are taught by the Delft Institute of Applied Mathematics, and the mandatory master's course Ethics for Aerospace Engineers is taught by lecturers from both the Faculty of Aerospace Engineering and the Faculty of Technology, Policy & Management (TPM).

Lecturers must have a University Teaching Qualification (UTQ) or obtain one within three years of employment. This qualification focuses on course design, assessment, student guidance and teaching methods. The current number of UTQ-qualified lecturers is relatively low, mainly because many new lecturers have recently been appointed who are still completing the qualification process. The faculty expects these numbers to go up significantly in the next few years. Since 2023, TU Delft has also been offering the Senior UTQ programme, which is for experienced lecturers who want to play an active role in tackling education-related issues within the faculty or programme.

During the 2019 review, the student-to-staff ratio was 30:1. That ratio has since improved considerably (to 22:1) but remains one of the highest within TU Delft. The high student-to-staff ratio has been an important reason for introducing a numerus fixus for the bachelor's programme and attracting more staff. The faculty is doing everything it can to attract new staff, but is experiencing a severe shortage in the labour market. In the 2024-2025 academic year, approximately 10% of vacancies remained unfilled.

In order to continue delivering quality education, the faculty relies on Teaching Assistants (TAs). TAs are senior students who have been thoroughly trained to supervise bachelor's students. The TA training programme includes a focus on intercultural awareness in order to adequately support the diverse student population.

In addition to TA guidance, bachelor's students receive support from academic counsellors. Academic counsellors monitor students' study progress, approach students who are falling behind in their studies, and offer support with personal or study-related problems. Academic counsellors also organise workshops on study skills.

Students and lecturers have stated that academic counsellors are very accommodating. Academic counsellors seek tailored solutions for students with disabilities or special personal circumstances to ensure that students can continue their studies without compromising academic standards. The Board of Examiners indicated that it always considers individual requests carefully, often in consultation with the academic counsellors, whose advice plays a central role in determining appropriate measures. Lecturers also confirmed that they follow the counsellors' recommendations and aim to create a supportive learning environment.

Master's students receive support from supervisors (thesis supervisors). Supervisors play a key role in the thesis process, which forms a significant part of the master's programme. They support students in choosing and defining a thesis topic and provide substantive guidance during the research process. Students can also seek guidance from MSc track coordinators, profile coordinators, and academic counsellors on their own initiative. Throughout their thesis project, students have access to faculty resources, such as laboratories, simulation tools, and workshops, as appropriate to their project.

The graduation process for both programmes is well-documented in a graduation manual. For the master programme graduation is coordinated through the faculty's track-specific graduation offices, which provide administrative support and help ensure procedural consistency.

Quality of education

The quality of the education and assessment is systematically evaluated by both Educational and Student Affairs (ESA) and the Leonardo da Vinci study association. After each course, ESA conducts quantitative

digital student surveys among all students. The Leonardo da Vinci study association, under the responsibility of an ESA Quality Assurance Officer, conducts qualitative evaluations among a group of student volunteers (at least five per course). The results of all evaluations are shared with the track coordinators and the relevant lecturers and form input for the continuous improvement of the education.

Study duration

The information file and interviews with bachelor's and master's students show that students experience the workload of the programmes as high. Not many students manage to graduate within the set time frame. The programmes are intensive, challenging and require a high level of knowledge, skills and independence. The programmes have an ambitious student population: students are driven and set high personal goals. Many of them combine their studies with extracurricular activities such as joining DREAM teams¹ or positions on boards, driven by strong intrinsic motivation and the desire to distinguish themselves in the labour market. However, these extracurricular activities cause them to fall behind in their studies.

In their pursuit of excellence, students often spend more time on courses than the standard 28 hours per EC. Nevertheless, the study success rate is good: 78% of first-year students in 2023-2024 achieved a positive BSA and 77% of students complete their bachelor's degree within four years. In the master's phase, the average study duration is longer than in the bachelor's phase. Approximately 10% of master's students graduate on time (within two years). Approximately 56% of the master's students graduate within three years. The faculty has carefully analysed the causes of delay and identified several key challenges: the workload of courses, the requirements that companies impose on the internship, and the scope of the graduation process.

Regarding the workload of courses, the faculty has previously explored whether students could keep track of the exact hours they spend per course. These insights confirmed that students often exceed the expected study load, which can contribute to delays when the cumulative workload becomes too high.

The internship particularly often leads to study delays. Although the master requires a three-month internship, many companies require a commitment from students of four to six months. International students sometimes face additional barriers, for example in finding an internship position due to a lack of having a local network. Other constraints include visa requirements in terms of length of stay and higher tuition fees. To counteract study delays, the faculty has introduced two alternatives to the internship into the curriculum as part of the MSc vitalisation: the Joint Interdisciplinary Project and the Technology Venture Development course. These alternatives have a fixed length that corresponds to the number of ECs.

Students also incur study delays during the graduate process. One of the measures taken by the faculty to reduce study delays is the effective incorporation of the Literature Study course (which used to be taught as a separate course) into the graduation phase. The faculty has also mandated a maximum 39-week nominal graduation period. The faculty expects that a required nominal graduation period will contribute to a reduction in the length of study and fewer uncompleted thesis projects.

¹ <https://www.tudelft.nl/en/dreamhall/projects/tu-delft-dream-teams>

Considerations

The panel establishes that the Aerospace Engineering faculty offers a strong and coherent bachelor's program with a comprehensive and solid foundation. With its three continuous learning lines and thematic semesters, the curriculum has a logical structure and gradually increases in complexity and autonomy. Students are generally satisfied with the structure and setup of the curriculum. A point of concern is the course Programming & Scientific Computing in Python (2 EC). The panel recommends expanding this course to 5 EC, so that even students without prior knowledge will have sufficient time and support to develop the programming skills they will need in later years. Additionally, the panel supports the students' suggestion to include training in tools such as GitHub, which are essential for collaborative software development and are widely used in later design and research projects. The panel also appreciates that the faculty intends to include broader themes, such as space engineering, the UN Sustainable Development Goals, and management and business economics, in the upcoming revision of the bachelor's programme. These topics align with both student interests and the evolving demands of the aerospace engineering field. But the panel would like to emphasise that this should not increase the overall workload.

The panel notes that the master's curriculum, like the bachelor's programme, is well constructed and structured. Within the Aerospace Engineering master's programme, the faculty offers a wide range of tracks (5 in total) and profiles (2 to 3 profiles per track, 12 in total) in which students are adequately prepared to achieve the required final qualifications. Through the tracks and profiles, students develop into specialists who can independently conduct complex research. The panel establishes that all tracks, although different in content, have the same structure, foundation and academic level.

The panel is impressed by the strong learning environment offered by both programmes. Despite the large number of students, both bachelor's and master's students feel part of a committed and dedicated community. Like one big family. The teaching and learning environment is student-centered, with engaging teaching methods. The project-based teaching during the bachelor's programme, culminating in the Design Synthesis Project, is powerful and inspiring. Project-based teaching helps students develop soft skills such as project management and collaboration skills. One point of consideration is that the non-technical skills that students develop during the bachelor's programme are not specifically taught or assessed. The final qualifications 'Be competent in cooperating and communicating' and 'Consider the temporal and societal context' are identifiable in the programme, but are mainly addressed implicitly. The panel agrees with the comments alumni made during the site visit to pay more attention at the communication with other disciplines since in practice graduates will work in interdisciplinary teams. The panel therefore recommends formulating explicit learning objectives that focus on the development of non-technical skills, such as teamwork, conflict management, intercultural collaboration, and addressing sustainability challenges. By making these learning objectives explicit, students become more aware of the importance of such skills, and it enables lecturers to provide more targeted support and assessment.

The panel also points out an important consideration regarding admission to the master's programme. The project-oriented education of the bachelor's programme in Aerospace Engineering at TU Delft is so

distinctive that students who are admitted to the master's programme with another bachelor's degree are less prepared for project-based work. The panel advises the faculty to encourage students who have not acquired any demonstrable experience with project design in their previous education to take an elective course aimed at strengthening practical and collaborative skills. In addition, the panel notes that the increasing number of students poses a challenge for maintaining the student–staff ratio on an acceptable level and guaranteeing the quality of the master's programme with respect to supervision and assessment. The faculty should consider limiting admissions to the master's programme, as is done for the bachelor's programme, and ensure sufficient staff capacity to maintain the quality of education .

The choice to offer both programmes in English and to use an English name is sufficiently justified by TU Delft in the panel's view. Conversations with management, lecturers, students, and representatives from industry clearly show that the bachelor's and master's programmes in Aerospace Engineering are geared towards an international sector. The sector operates on an international level and has a strong demand for graduate aerospace engineers who are capable of working in an international setting. The programme employs many international lecturers and has a large percentage of international students. The panel considers the English language proficiency of the lecturers to be adequate.

The panel sees that both the bachelor's and master's programmes are taught by dedicated and knowledgeable lecturers. In recent years, the faculty has invested significantly in attracting new lecturers. Not all new lecturers have the required teaching skills when they start, but the faculty provides an adequate response to this with an intensive UTQ programme. The faculty addresses challenges related to workload and labour market shortages by utilising TAs. TAs are senior students who have been thoroughly trained to supervise bachelor's students. The panel recommends maintaining the current setup with TAs, as they provide valuable support to students.

The panel concludes that the programmes are intensive and ambitious, and that the students are motivated and performance-oriented. The combination of a demanding curriculum, high personal goals, and extracurricular activities contribute to a high workload in both the bachelor's and the master's phase. While this does not necessarily translate into significant study delay in the bachelor's phase, students consistently report experiencing a heavy workload. In the master's phase, this high workload is compounded by a lengthier study duration. The panel appreciates the faculty's careful analysis of the causes of delays and the appropriate measures it has taken, such as structuring the thesis phase and offering internship alternatives with a fixed duration. At the same time, the panel believes that the faculty has a responsibility to ensure that students are able to graduate within the prescribed time frame, even when students opt for an internship. Therefore, the faculty should consider, in consultation with students and industry, adjusting the structure of the master's curriculum in such a way that internships are realistic and do not lead to study delays.

Conclusion

Based on the interviews and examination of the underlying documentation, the panel concludes that the programme **meets standard 2**, teaching-learning environment.

Standard 3: student assessment

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

Findings

The Faculty of Aerospace Engineering has an adequate assessment policy that is laid down in the document Assessment and Examination Policy Plan for the Faculty of Aerospace Engineering. This document describes the principles and procedures for designing, organising, conducting, and evaluating assessments. With these principles and procedures, the faculty ensures that the assessment system is valid, reliable, and transparent. The assessment policy is further specified in the Teaching and Examination Regulations (TER) for both the bachelor's and master's programmes. The TER describes the rights and obligations of students regarding education and assessments.

The faculty considers assessment to be an excellent means of supporting the learning process of students and of assessing whether students have mastered the intended final level. The programmes use various summative assessment methods, such as exams, assignments, reports, and computer-based assessments. Formative assessment provides students and lecturers with regular insights into the progress of students.

When developing summative tests, examiners apply the four-eyes principle to ensure the quality of the exams. The faculty stipulates that each exam must be approved by both the responsible examiner and a second assessor. Examiners use a test matrix to ensure that the test is aligned with the learning objectives and that the grading is consistent. The Board of Examiners carries out random checks to monitor the working methods of examiners.

Bachelor

In the bachelor's programme, foundation courses in mathematics, physics and engineering are usually assessed by written or digital exams. The learning objectives of these courses focus primarily on understanding, applying and integrating knowledge. Resits are scheduled at the end of the next block. To actively engage students in their learning process, many courses include formative midterm exams or assignments.

Project work, such as the design projects and the DSE project carried out by students within the bachelor's programme, always results in an individual grade. The individual grade consists of two parts: a weighted average of the group grade and the grade for individual contribution. Both components must be at least a 6.0. The assessment of students includes their technical qualities, attitude, initiative, and leadership during the project.

While reviewing the completed DSE assessment forms, the panel noted that it was difficult to determine how individual performance within team projects is assessed and how grades are determined. The grades given were not always substantiated in writing. Without written explanation, it is unclear how a grade was determined. Discussions with the Board of Examiners revealed that students generally understand why they received a particular grade. At the start of each design project, the assessment criteria are communicated to students. During the project, students receive continuous feedback during both scheduled and ad hoc meetings with their tutor and coaches. This feedback is explicitly linked to detailed

uniform rubric criteria and is incorporated by students into their capstone project. The multiple feedback moments help ensure that the grade does not come as a surprise. In total, three formal review moments are organised: the Baseline Review, Midterm Review, and Final Review. The tutor formally assesses and grades students twice: after the Midterm Review (formative grade) and at the end of the project (summative final grade). To ensure consistency and transparency, a member of the Design Synthesis Coordination Committee is present during final assessments, and a representative of the Board of Examiners attends the final review to safeguard assessment quality and verify that intended learning outcomes are achieved.

Students can request the Board of Examiners to inspect the assessment and the underlying documents. If students raise an issue regarding their grade, the Board of Examiners will ask the tutor or supervising staff for an explanation. Teaching staff usually keep logbooks in which they record students' progress and individual contributions; however, the Board of Examiners acknowledge that the use of logbooks varies among lecturers.

Master

Within the master's programme, assessment takes place through homework assignments and (a combination of) written and oral exams. Assignments typically involve in-depth theoretical analyses of scientific and technical topics, often supplemented with programming exercises. Some courses include practical components, such as wind tunnel measurements. Practical assignments are completed with a written report. Instructors choose assessment formats that align with the learning objectives of each course, including formative tests. For summative assessment, instructors are encouraged to use assessment forms to ensure consistency in grading.

During the master's internship, students are assessed by their internship supervisor (an employee of the company where the internship is taking place) halfway through and at the end of the internship. The internship supervisor fills out an assessment form on both occasions. The internship supervisor forwards the assessment forms to the faculty's internship coordinator. If the results are insufficient, the internship coordinator will contact the student to see if any adjustments might be needed. At the end of the internship, the student submits a written report. The report is assessed by the internship coordinator and a member of the academic staff using a standardised assessment form. The assessment is satisfactory, conditional satisfactory, or unsatisfactory, and must be substantiated with a written justification. In the event of a conditional satisfactory or unsatisfactory result, the student must revise the report. Students are given two attempts to achieve a satisfactory result for the report.

The thesis project is an individual, in-depth research or design project within the profile chosen by students. Students independently conduct in-depth research or a design project within their chosen specialisation. The project is sometimes part of a broader research programme, which means that students must plan their work in accordance with the progress of the overarching project. The research results are recorded in a thesis which can contain a draft scientific article suitable for publication. During the thesis, students are supervised by a daily supervisor (who is a scientific staff member). The thesis project starts with a kick-off meeting, where students present the goal and plan for their research. Seven weeks after the start of the graduation project, the Research Proposal Review meeting takes place. During the Research Proposal Review, students present their literary overview, research questions, and

plan of action. Both meetings provide opportunities for targeted feedback, alignment with learning objectives, and early identification of issues. The supervisor(s) assess whether the research questions are relevant and viable.

The final deliverable is a draft of the master thesis which students must submit one week before the so-called green light meeting. The supervisor(s) read the draft version of the thesis or article and check it for plagiarism using a plagiarism detection tool. At the green light meeting, the supervisors assess the student's work based on a fixed set of assessment questions. Based on this assessment, the supervisors decide whether students will be allowed to proceed to the final assessment (Go) or whether they need to make improvements to the draft version (No Go). In the event of a No Go, students receive specific feedback and have six weeks to revise their draft and request a new green light meeting. Upon receiving a Go, the final assessment process commences. The final assessment consists of a public presentation of the concept document and a private defence in front of a graduation committee (usually consisting of an examiner from the respective master's track, the supervisor, and an independent examiner). The graduation committee awards separate grades for each component in the rubric based on assessment rubrics, the weighted average of which constitutes the final grade.

Generative AI

At the time of the site visit, the Board of Examiners was in the process of developing a formal policy framework on the responsible use of generative AI in education. Within the faculty, AI is considered a supportive tool, comparable to the emergence of software tools in previous decades. The Advisory Council has emphasised that the aerospace industry increasingly expects graduates to be proficient in working with AI tools. Both the faculty and industry stakeholders agree that students must be equipped to use AI in a critical, ethical, and responsible manner. To safeguard the integrity of assessment and ensure that students genuinely understand the course content, the faculty is exploring additional measures such as oral examinations.

Quality assurance

The quality of assessment is guaranteed at various levels within the organisation. At the academic level, its quality is guaranteed by the faculty-wide Board of Examiners, lecturers, and coordinators of the bachelor's and master's tracks. The Board of Examiners monitors the quality of assessment and the correct application of the TER. The Board of Examiners consists of nine members. Eight members are staff members of the Faculty of Aerospace Engineering (two members from each research department) with teaching experience at the bachelor's and master's levels. One member is an external staff member of the Faculty of Civil Engineering and Geosciences. In accordance with the legislative framework, the Board of Examiners is responsible for ensuring the final level of both programmes and for appointing examiners. For the master programme, each year, the Board selects a representative number of theses, which are reassessed in terms of both quality and the grade awarded. During its discussions with Board representatives, the panel observed that the Board takes its statutory responsibilities seriously, possesses a comprehensive understanding of the curriculum and assessment procedures, and is actively engaged in maintaining the quality and integrity of assessment. For each curriculum component (courses and projects), an examiner is appointed who is authorised to conduct and assess exams.

Considerations

The panel believes that the faculty's assessment policy is adequately described, well thought out, and carefully implemented within the bachelor's and master's programmes. Both programmes use a variety of assessment methods. The assessment methods are consistent with the learning objectives and contribute to the learning process of students. The panel notes that the assessment methods are generally valid, reliable, and transparent in terms of design and implementation.

The panel considers the assessment procedure for both the bachelor capstone project and master's thesis project is well thought out and carefully designed. Throughout the final projects, students receive support, regular feedback and are assessed on several occasions. The panel believes that this approach contributes to motivating students to complete the programme and helps to reduce the average study duration.

Whilst reviewing the DSE assessment forms, the panel noted that grades were not always substantiated in writing. The panel therefore found it difficult to gain a clear understanding of how individual performance within team projects is assessed and how grades were determined. The Board of Examiners indicated that lecturers and teaching assistants generally keep track of students' progress in logbooks and that progress meetings are held regularly. The panel recommends making the keeping of logbooks mandatory, so that individual achievements are transparent. Another possible improvement could be the introduction of midterm presentations before multidisciplinary review panels, more closely mirroring real-world engineering design review practices.

The panel appreciates the faculty's proactive stance on the integration of AI in education. It supports the view that AI should be treated as a tool, provided that students have developed a firm foundation in fundamental aerospace knowledge and the critical capacity to use such tools responsibly. The panel endorses the development of a formal policy by the Board of Examiners and encourages the continued exploration of assessment methods that verify students' individual understanding and active engagement.

The quality of assessment is adequately guaranteed. The panel is impressed by the proactive and committed Board of Examiners, which takes its legal duties seriously and has a good understanding of the curriculum and the assessment process within the bachelor's and master's programmes. The Board plays an active role in monitoring assessment quality and in ensuring that graduates achieve the intended final level. The assessment quality is guaranteed through the four-eyes principle, the use of assessment forms, and the close engagement of both the Board of Examiners and the examiners.

Conclusion

Based on the interviews and examination of the underlying documentation, the panel concludes that the programme **meets standard 3**, student assessment.

Standard 4: achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

Findings

In order to assess the final level achieved in both programmes, the panel studied fifteen bachelor capstone project reports, and fifteen master theses, including the accompanying assessment forms, of students who graduated between 2022 and 2024. The panel concludes that the final level for both programmes has been more than adequately achieved. The overall quality of the final projects is high and demonstrates that students are well prepared for further academic study (for bachelor's students) or for a professional career or PhD trajectory (for master's students).

Students who successfully complete the bachelor's programme in Aerospace Engineering have a solid foundation in aeronautical engineering, including design and research competencies, as well as personal and interpersonal skills. Students have adequately demonstrated in their bachelor capstone project, the ability to independently acquire and apply new knowledge, analyse complex problems, and develop multidisciplinary aerospace systems within a professional team setting. In addition, students show they can effectively communicate about their design and design process, both within their team and with external stakeholders.

Graduates of the master's programme in Aerospace Engineering are able to analyse, design and realise complex technical systems in interdisciplinary and often international settings. They can conduct independent research and function at a high level within R&D environments. In addition, they have mastered skills in project planning, communication and academic writing.

Based on interviews with master's students, lecturers and professionals from the industry, the panel notes that the project-oriented education provided by the bachelor's programme in Aerospace Engineering at TU Delft is so distinctive that students who enter the programme with a different bachelor's degree are less prepared for project-based work. Industry professionals in particular notice significant differences between students who have and have not completed the bachelor's programme in Aerospace Engineering at TU Delft. Skills such as project-based working and collaboration often prove to be underdeveloped in students without this prior education.

Alumni

The bachelor's programme prepares students for a master's degree in engineering at a research university. Approximately 75% of students who successfully complete the bachelor's programme go on to pursue a Master of Science in Aerospace Engineering. In 2023–2024, 6.1% of students graduated cum laude; in recent years, this has varied between 4.9% and 7.6%. Research groups within the faculty express their satisfaction with the thorough preparation that students receive from the bachelor's programme. The Advisory Council is also positive about the level of knowledge and skills of the graduates. Although certain companies hire professionals who have only completed a bachelor's degree, most interviewees indicate that a completed master's degree is required within the sector.

Alumni value the coherent structure and academic depth of the bachelor's programme. The DSE is consistently mentioned as the most valuable component. The 2023 alumni survey, held among students

who had recently completed the DSE, shows a high level of satisfaction (average score of 8 out of 10). Students particularly appreciate the project and group work, the academic depth, the quality of the programme, the commitment and enthusiasm of lecturers, and the international learning environment. However, students, alumni and lecturers did mention that students' self-management skills could be further strengthened in the bachelor's phase. This has now been included as a priority in the revision of the bachelor's curriculum.

Graduates of the master's programme usually find a suitable job quickly. According to the 2024 alumni survey, 34% of graduates found work immediately after graduation, and 69% within three months. Most alumni work in the aviation industry, IT or technical sector. A growing number of students choose to pursue a PhD after completing their master's degree, at institutions such as MIT, Georgia Tech and the Max Planck Institute.

Employers, often TU Delft graduates themselves, are positive about the graduates. They praise their conceptual thinking skills, analytical abilities, independence and ability to collaborate. Graduates are able to integrate insights from different disciplines into a well-founded and functional design. Alumni express their appreciation for the academic depth and personal growth they experienced during their studies. They indicate that the knowledge and skills they acquired are instantly applicable in a professional setting. They are able to approach complex issues from different angles and provide clients with creative and appropriate solutions.

To strengthen ties with alumni, the faculty has set up the Mentor Alumni Programme (MAP), in which alumni act as mentors for students. In addition, alumni are active in Alumni Chapters in cities such as Toulouse, Munich and Bremen. The faculty regularly organises networking meetings, symposia and events where alumni and students can meet and the business community can get involved, for example through internships or external graduation projects.

Considerations

The panel is of the opinion that the final projects of both the bachelor's and the master's programmes demonstrate that the intended final attainment levels are achieved. The academic quality of the final work is excellent.

The panel found that both representatives from the professional field as well as alumni are very pleased with the knowledge and skills covered during both the bachelor's and master's programmes. Employers value graduates' conceptual thinking skills, analytical skills, independence and ability to collaborate. They recognise that graduates are able to combine insights from different disciplines into a functional design and can justify the choices they have made to their clients. Alumni feel that the knowledge and skills they have acquired during the programme are valued by their employers.

Conclusion

Based on the interviews and examination of the underlying documentation, the panel concludes that the programme **meets standard 4**, achieved learning outcomes.

Overall conclusion

The panel has assessed the programme along four standards. The panel concludes that the programme meets all standards (intended learning outcomes, teaching-learning environment, student assessment and achieved learning outcomes) and subsequently assesses the overall quality of the programme as positive.

Standard	Assessment
<p>Intended learning outcomes</p> <p><i>Standard 1: The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.</i></p>	Meets the standard
<p>Teaching-learning environment</p> <p><i>Standard 2: The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.</i></p>	Meets the standard
<p>Student assessment</p> <p><i>Standard 3: The programme has an adequate system of student assessment in place.</i></p>	Meets the standard
<p>Achieved learning outcomes</p> <p><i>Standard 4: The programme demonstrates that the intended learning outcomes are achieved.</i></p>	Meets the standard
Overall conclusion	Positive

In the previous sections, the panel has evidenced and articulated its positive considerations about the programme per standard. It established that:

- The bachelor's and master's programmes in Aerospace Engineering at TU Delft are well-designed, ambitious, and internationally recognised.
- The intended learning outcomes are clear, relevant, and aligned with international frameworks and industry needs.
- The distinctive project-based learning approach, particularly the bachelor's Design Synthesis Exercise (DSE), is highly valued by students and industry alike.
- The faculty offers modern facilities and maintains a stimulating international learning environment.
- The Board of Examiners plays an active and transparent role in safeguarding assessment quality and is developing policies on responsible AI use.

- The quality of final projects and theses is excellent, showing students are well prepared for academic or professional paths.
- Strong connections with alumni and industry enrich the programme and support graduate employability.

In addition to the positive considerations, the panel formulated some recommendations for improvement on several aspects of the programme. It therefore suggests the Faculty of Aerospace Engineering at TU Delft to:

- Explicitly integrate non-technical skills such as self-management, teamwork, conflict management, intercultural collaboration, and addressing sustainability challenges into the learning outcomes and assessment.
- Provide better preparation and support for master's students without prior project-based experience to ensure their success in research-driven projects.
- Clarify and standardise methods to assess individual contributions within group projects in the bachelor.
- Balance the structure of master internships and master thesis projects to offer students distinct, meaningful experiences without causing study delays.
- Find an optimal balance between the (already heavy) workload and the need to implement additional courses in the programme as ethics, AI and business management. Implementing these courses will leave less time for other courses.
- Limit the number of admissions to the master's programme to keep the student to staff ratio on an acceptable level and guarantee the quality of the master's programme.

4. ANNEXES

Annex 1: Administrative data

Information on the institution

Name: TU Delft <https://www.tudelft.nl/>
Status: publicly funded
Result ITK: positive 2017
Address: Mekelweg 5, Delft
Faculty: Aerospace Engineering, Kluyverweg 1, Delft

Information on the programme

Name: Aerospace Engineering
RIO: 56956 and 66956
Level: bachelor and master
Orientation: academic
Credits: 180 and 120
Mode of study: full-time
Language: English
Mastertracks: Aerodynamics & Wind Energy, Control & Operations, Space, Aerospace Structures & Materials, Flight Performance & Propulsion
Location: Kluyverweg 1, Delft

Annex 2: Site visit programme

Date: 12 and 13 June 2025

Venue: Faculty of Aerospace Engineering, Kluyverweg 1, Delft

Day 1 – 12 June

Time	Activity
09:00-09:10	Arrival, Welcome by the Dean
09:10-09:55	Programme management (Educational Management Team)
09:55-10:05	Break, panel deliberation
10:05-10:50	Lecturers BSc
10:50-11:00	Break, panel deliberation
11:00-11:45	Lecturers MSc
11:45-11:55	Break, panel deliberation
11:55-12:30	Lunch, panel deliberation
12:30-13:30	Faculty Tour
13:30-13:45	Break, panel deliberation
13:45-14:30	Board of Examiners
14:30-14:50	Break, panel deliberation
14:50-15:35	Students BSc + FSC/VSV
15:35-15:45	Break, panel deliberation
15:45-16:30	Students MSc + FSC/VSV
16:30-17:30	Panel deliberation

Day 2 – 13 June

Time	Participants
09:00-09:15	Arrival
09:15-10:00	Board of Studies
10:00-10:15	Break, panel deliberation
10:15-10:45	Alumni
10:45-11:00	Break, panel deliberation
11:00-11:45	Advisory Council
11:45-12:00	Break, panel deliberation
12:00-13:00	Lunch
13:00-13:30	Educational Management Team
13:30-15:00	Panel deliberation
15:00-16:00	Development dialogue
16:00-16:30	First Impressions (public)
16:30-17:00	Closing

Annex 3: Documents

Self-evaluation report

- BSc Self-Evaluation Report 2025 (digital)
- MSc Self-Evaluation Report 2025 (digital)
- Annexes:
 - Final Qualifications of BSc in Aerospace Engineering
 - Reflection on previous visitation (2019)
 - Detailed BSc Curriculum
 - Final Qualifications of MSc in Aerospace Engineering 33
 - Domain-Specific Framework of Reference
 - Relationship between MSc final attainment levels and intended learning outcomes of core and profile courses
 - Learning outcomes per track
 - Reflection on the previous (2019) and the mid-term visitation

Materials made available electronically

Standard 1 – Intended Learning Outcomes

- Advisory Council Minutes
- Action Plan Midterm Audit

Standard 2 – Teaching and Learning Environment

- Vision on Education TU Delft
- Concept Vision on Education – Faculty of AE
- Teaching and Examination Regulations (OER-TER LR 2024–2025)
- Implementation Regulations (UR-IR 2024–2025)
- Rules and Guidelines (RRvE 2024–2025)
- BSc Selection Regulations Guidelines 2025–2026
- Selection Procedure Manual 2025–2026
- Syllabus First-Year AE Topics 2025–2026
- Syllabus Selection Exam – Mathematics & Physics
- MSc Placement Procedure Regulations 2025–2026
- Track Capacity Determination MSc 2025–2026
- Board of Studies Minutes
- EMT Timeline and Minutes
- Faculty Student Council (FSC) Minutes 13-02-2025
- Solicited Advice BoS Q2 Report
- Annual Report 2022–2023
- Quarterly Report 2022–2023
- Overview of Staff

- NSE Results 2024 + Analysis
- Student Evaluation BSc Lunch 2023–2024
- MSc Student Evaluation Lunch 2024–2025
- AE Bachelor Update – Revised Programme Learning Objectives
- Final Design Report CFT (Concept Final Task)
- Preferential Policy BSc AE
- Discussion Paper MSc_3
- BSc Curriculum Overview

Standard 3 – Assessment

- TU Delft Assessment Framework
- Assessment Policy LR Faculty
- Plan of Action Assessment AE Sept 2024
- Annual Report Examination Committee 2021–2024
- Sample Exam AE2235-II July 2024 + Answer Key
- MSc Thesis Rubrics 2022–2023
- Implementation MSc Thesis Monitoring Tool

Standard 4 – Achieved Learning Outcomes

- Overview of 15 Bachelor Graduation Projects (academic years 2022–2024)
- Overview of 15 Master Theses (academic years 2022–2024)
- Alumni Survey Results NAE 2023 (MSc AE-specific)
- TU Delft Alumni Research 2024 – MSc general
- Memo on discontinuation of EWEM programme
- Guidelines Thesis Duration Committee 2024–2025

Final graduation projects

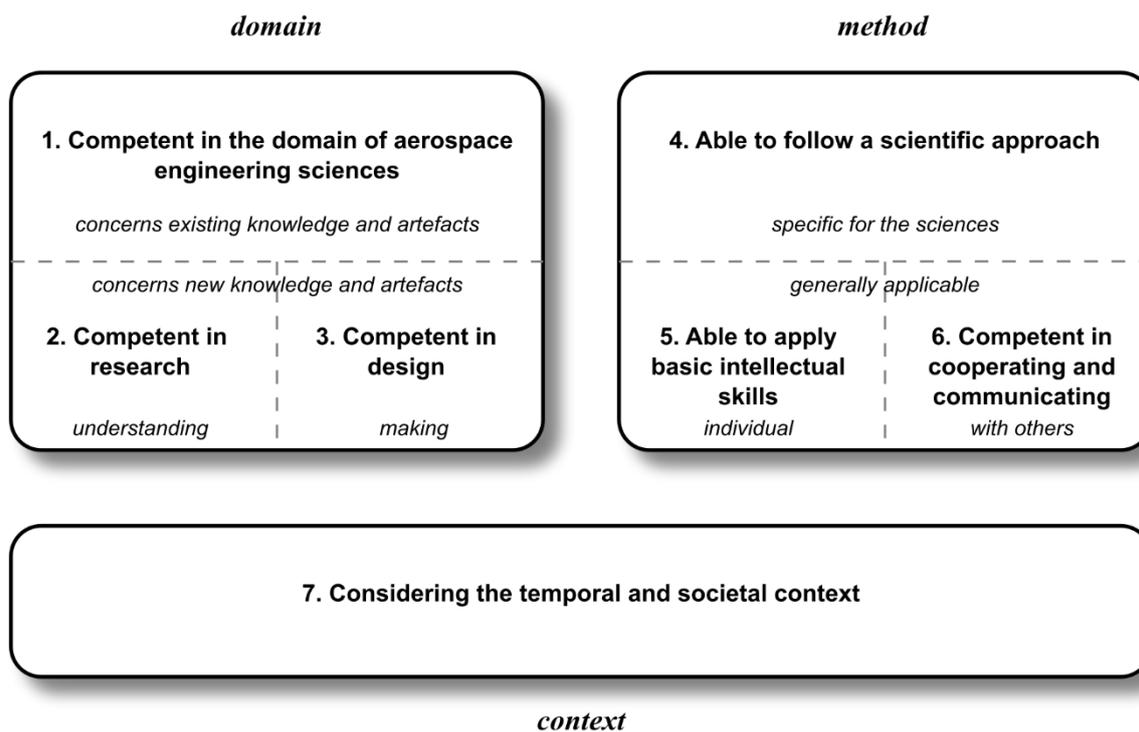
15 bachelor final reports and 15 master's theses from the academic years 2022–2024 were made available. The selection reflects a balanced distribution across grading categories (i.e. sufficient, good, and excellent) for both bachelor and master level. In addition, the master's theses were proportionally distributed across the various MSc tracks:

Aerodynamics & Wind Energy, Control & Operations, Space, Aerospace Structures & Materials, Flight Performance & Propulsion.

Annex 4: Final Qualifications

Final Qualifications of BSc in Aerospace Engineering

The competence areas of a BSc university graduate are represented in the figure below, which was taken from the 3TU “Criteria for Academic Bachelor’s and Master’s Curricula”.



For each competence, it is indicated whether the competence is knowledge-, skill- or attitude-related:

[k] = knowledge

[s] = skill

[a] = attitude

BSc-I Competent in the domain of aerospace engineering sciences

The fields of major subjects in aerospace engineering sciences

A	Mathematics	Calculus, differential equations, linear algebra, vector calculus, numerical methods, statistics, probability and observation theory.
B	Thermodynamics	Equations of state, entropy, constant pressure, volume temperature, 1st & 2nd laws, energy, exergy, efficiencies, power and cooling cycles, heat transfer.
C	Electromagnetism and optics	Electricity, magnetism, optics.
D	Fluid Mechanics	Conservation of mass, energy, momentum, boundary layer, laminar and turbulent flow, Bernoulli, Navier-Stokes, dimensionless analysis, compressible flow.
E	Aerodynamics	Aircraft aerodynamics, airfoil and wing theory, incompressible flow, compressible aerodynamics propeller theory, sub- and supersonic flow, Mach effects.
F	Solid Mechanics	Statics, kinematics, dynamics, stress analysis, strength and vibrations, finite-element methods.
G	Flight Mechanics	Stability, control, performance of aircraft, helicopters and hovers, flight performance optimisation.
H	Propulsion	Gas turbine, rocket.
I	Materials Science / Aircraft Structures	Relation between structure and properties for metals, plastics, ceramics, composites; failure, fracture, fatigue, wear, manufacture, production; buckling, shear panels, thin-walled structures.
J	Systems & Control Engineering	Modelling, simulating, automation control, system identification, tools, avionics, fundamental and instrumental electronics, sensors and actuators, positioning, guidance and navigation.
K	Design of aircraft, spacecraft and rockets	Design methodologies, systems engineering, aircraft and spacecraft systems, vehicle engineering, reliability, safety, inspection and quality control, testing, engineering design standards, maintenance and (mission) operations, product life cycle.

L	Astrodynamics	Orbits and orbit dynamics, ascent, re-entry, interplanetary flight trajectories, space environment, space mission design.
M	Space Science	Observation requirements, measurement techniques, planetary space research, physical phenomena and principles.
N	Information Technology	Fundamentals, software architecture, programming techniques, tools for design, analysis and simulation.
O	Management, economics & communications	Management and organisation, economics, aerospace business marketing, air and space law, sustainability.

The BSc graduate has a consolidated body of knowledge in the fields of basic and engineering sciences, and aerospace engineering sciences in particular, and has the skills to increase and develop this further through study.

- a. 1 - Understands the knowledge base of the critical fields to the extent that the student can apply it in basic physical and mathematical models that adequately simulate reality. [k]
2 - Is able to validate models following an accepted scientific approach. [ks]
- b. Is able to relate and apply general engineering sciences to disciplines using appropriate methods and tools. [ks]
- c. 1 - Has basic knowledge and skills in assessing theories and models in the field of aerospace engineering sciences. [ks]
2 – Has basic knowledge and skills in applying theories and developing models in the field of aerospace engineering sciences. [ks]
- d. Has basic knowledge and skills in conducting experiments and simulations and gathering data in the relevant fields of aerospace engineering sciences. [ks]
- e. Has basic knowledge and skills in deducing knowledge from data, text, problems and results in the field of aerospace engineering sciences. [ks]
- f. Has basic knowledge and skills of accepted criteria on which decisions are based within the specific fields of aerospace engineering sciences. [ks]
- g. Is aware of the limits of usability of standard methods and procedures used in aerospace engineering sciences. [ksa]

BSc-II Competent in research

The BSc graduate has an understanding at an introductory level of the most important research issues in the aerospace related sciences, and is aware of the connections with other disciplines. For this purpose, research means: the development of new knowledge and new insights in a purposeful and methodical way.

- a. Is able to spot deficiencies in a problem statement, to indicate how to reformulate the problem and to justify his choices. [ksa]
- b. Is observant, and has the creativity and the capacity to discover connections and views from different perspectives. [ksa]
- c. Is able to contribute to the execution of a research plan. [ks]
- d. Is able to work at different levels of abstraction, in relation to the research question at hand. [ks]
- e. Is aware of the importance of other disciplines. [ka]

BSc-III Competent in design

Designing is a synthetic activity aimed at the realisation of new or modified products or systems, with the intention of creating value in accordance with predefined requirements. The BSc graduate aerospace engineering is able to recognise, formulate and analyse engineering problems independently and to offer one or more acceptable solutions for new or modified items or systems, with the intention of creating value in accordance with predefined requirements.

- a. Is able to spot deficiencies in a design problem definition, to indicate how to mitigate these and to justify his choices. [ksa]
- b. 1 - Has sufficient creativity to come up with several solutions to a theoretical and/or practical design problem. [ka]
2. Has basic synthetic skills with respect to theoretical and practical design problems. [ks]
- c. 1 – Is able to interpret a set of requirements and translate these into a design plan containing at least planning, work breakdown and activity flow. [ks]

- 2 –Is able to execute the design plan according to accepted standards. [ks]
- d. Is able to work at different levels of abstraction, including systems level. [ks]
- e. 1 – Is aware of the importance of other disciplines. [ks]
2 - Is able to synthesise disciplines in a design, such that a compliant (sub-)system design is accomplished. [ks]
- f. Is aware of the changeability of the design process through external circumstances or advancing insight and is able to keep the design process under control (working in a team under guidance of a professional). [ka]
- g. Is able to integrate existing knowledge, information and numerical data from different sources in an efficient way into a design project. [ks]
- h. Has the skill to take design decisions, and to justify and evaluate these in a systematic manner. [ks]

BSc-IV Able to follow a scientific approach

The BSc graduate has a systematic approach characterised by the application of theories, development of models and the making of coherent interpretations, has a critical attitude and insight into science and technology in the aerospace domain.

- a. Is inquisitive and has an attitude of lifelong learning. [a]
- b. Has a systematic approach characterised by applying theories and developing models and making interpretations. [ksa]
- c. Has the knowledge and the skill to use, justify and assess as to their value models for research and design in the aerospace domain (model understood broadly: from mathematical model to scale-model). Is able to adapt and validate models for his or her own use. [ks]
- d. Has insight into the aerospace related sciences and technology and has an appreciation of uncertainty, ambiguity and limitations of knowledge. [k]
- e. Is able to report adequately the results of research and design. [ksa]

BSc-V Able to apply basic intellectual skills

The BSc graduate is competent in reasoning, reflecting, and forming a judgment. These are skills which are learnt in the context of aerospace problems, questions or environment, and which are generically applicable from then on.

- a. Is able to critically reflect on his or her own thinking, decision-making, and acting and to adjust these on the basis of this reflection. [ks]
- b. Is able to reason logically within the field and beyond; both “why” and “what-if” reasoning. [ks]
- c. Is able to ask adequate questions, and has a critical yet constructive attitude towards analysing and solving simple problems in the field. [ks]
- d. Is able to form a well-reasoned opinion in the case of incomplete or irrelevant data. [ks]
- e. Is able to comment meaningfully on a scientific argument in the field of aerospace engineering sciences. [ksa]
- f. Possesses basic numerical skills, and has an understanding of orders of magnitude. [ks]

BSc-VI Competent in cooperating and communicating

The BSc graduate has the competence of being able to work with and for others. This requires not only adequate interaction, a sense of responsibility, and preferably leadership, but also good communication with colleagues and non-colleagues. He is also able to follow a scientific or public debate.

- a. Is able to communicate both verbally and in writing about the results of learning, thinking and decision making with colleagues and non-colleagues. [ks]
- b. Is able to present verbally the solutions and conclusions of his or her work using state-of-the-art presentation techniques. [s]
- c. Is able to follow debates about the aerospace engineering sciences and its place in society. [ks]

- d. Is characterised by professional behaviour. This includes: drive, integrity, reliability, commitment, accuracy, perseverance and independence. [ksa]
- e. Is pragmatic and has a sense of responsibility; is able to deal with limited resources; is able to deal with risks; is able to compromise. [ksa]
- f. Is able to work within an interdisciplinary team. [ks]
- g. Has insight into, and is able to deal with team roles and social dynamics. [ks]

BSc-VII Considering the temporal and societal context

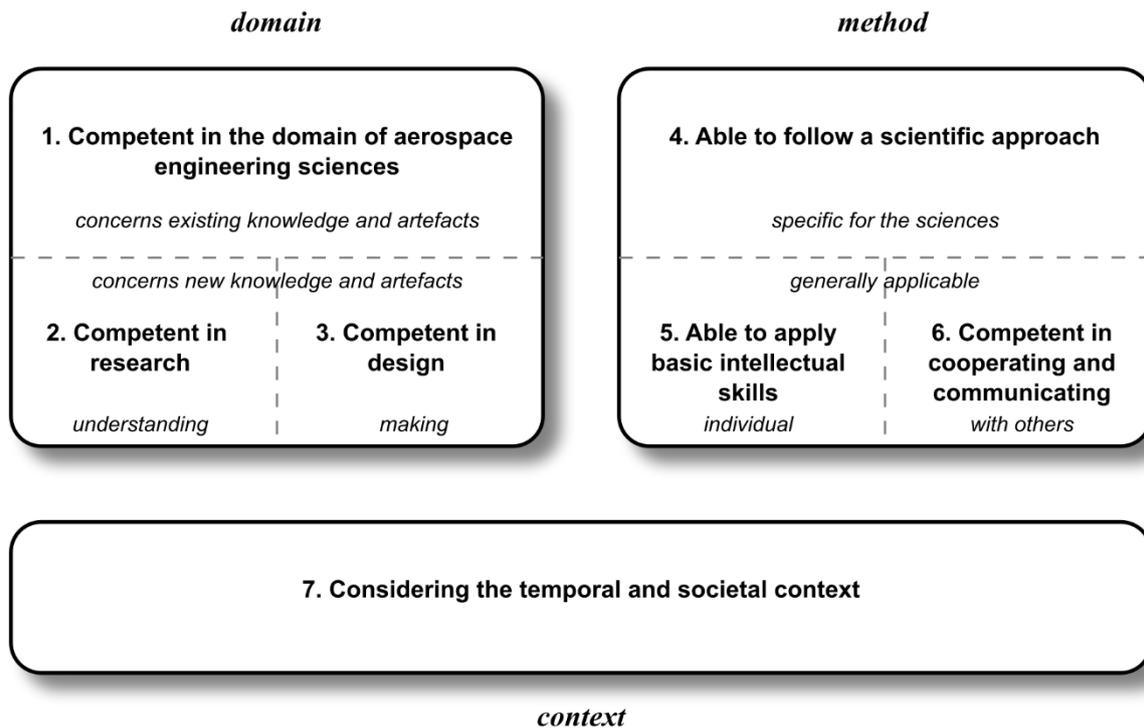
The aerospace engineering sciences are not isolated and always have a temporal and societal context. Beliefs and methods have their origins; decisions have societal consequences in time. The BSc graduate is aware of the fact that aerospace engineering sciences are not isolated and always have a temporal and societal context. He has knowledge and understanding of the context in which aerospace engineering and utilisation is practised by industry, institutes and organisations. He has the competence to integrate these insights into his work.

- a. Understands relevant (internal and external) developments in the history of aeronautics and spaceflight. This includes the interaction between the internal developments (of ideas) and the external (societal) developments, both national and international. [ks]
- b. Is able to analyse the societal context of the aerospace industry (economic, social, cultural) and the consequences of new developments and applications in the domain of aerospace engineering sciences and to discuss these with colleagues and non-colleagues. [ks]
- c. Is able to analyse and discuss the ethical, safety and sustainability consequences of professional activities in the domain of aerospace with colleagues and non-colleagues (both in research and in designing). [ks]

Has an eye for the different stakeholders in the fields of the aerospace engineering sciences. [ks]

Final Qualifications of MSc in Aerospace Engineering

The competence areas of an MSc university graduate are represented in the figure below, that was taken from “Criteria for Academic Bachelor’s and Master’s Curricula”.



For each competence an indication is given whether it is knowledge, skill or attitude related:

[k] = knowledge

[s] = skill

[a] = attitude

The MSc Final Qualifications are an elaboration of the following seven competences:

He or she

a. is competent in one or more scientific disciplines

The Aerospace Engineering graduate is familiar with existing scientific knowledge, and has the competence to increase and develop this through study.

b. is competent in doing research

The Aerospace Engineering graduate has the competence to acquire new scientific knowledge through research. For this purpose, research means: the development of new knowledge and new insights in a purposeful and methodical way

c. is competent in designing

The Aerospace Engineering graduate is familiar with the principles of design.

Designing is a synthetic activity aimed at the realization of new or modified artifacts or systems with the intention of creating value in accordance with predefined requirements and desires (e.g. mobility, health).

d. has a scientific approach

The Aerospace Engineering graduate has a systematic approach characterized 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.

e. possesses basic intellectual skills

The Aerospace Engineering graduate is competent in reasoning, reflecting, and forming a judgment. These are skills which are learned or sharpened in the context of a discipline, and which are generically applicable from then on.

f. is competent in co-operating and communicating

The Aerospace Engineering graduate has the competence of being able to work with and for others. This requires not only adequate interaction, a sense of responsibility, and leadership, but also good communication with colleagues and non-colleagues. He or she is also able to participate in a scientific or public debate.

g. takes account of the temporal and the social context

Science and technology are not isolated, and always have a temporal and social context. Beliefs and methods have their origins; decisions have social consequences in time. A university graduate is aware of this, and has the competence to integrate these insights into his or her scientific work.

The Aerospace Engineering graduate is familiar with existing scientific knowledge, and has the competence to increase and develop this through study.

- a. Has a thorough Mastery of a particular field in Aerospace Engineering extending to the forefront of knowledge (latest theories, methods, techniques and topical questions). [ks]
- b. Looks actively for structure and connections in a particular field of Aerospace Engineering and related scientific disciplines. [ksa]
- c. Has knowledge of and skill in the way in which truth-finding and the development of theories and models take place in a particular field of Aerospace Engineering. Has the skill and the attitude to apply these methods independently in the context of more advanced ideas or applications. [ksa]
- d. Has knowledge of and skill in the way in which interpretations (texts, data, problems, results) take place in a particular field of Aerospace Engineering. Has the skill and the attitude to apply these methods independently in the context of more advanced ideas or applications. [ksa]
- e. Has knowledge of and some skill in the way in which experiments, gathering of data and simulations take place in a particular field of Aerospace Engineering. Has the skill and the attitude to apply these methods independently in the context of more advanced ideas or applications. [ksa]
- f. Has knowledge of and some skill in the way in which decision-making takes place in a particular field of Aerospace Engineering. Has the skill and the attitude to apply these methods independently in the context of more advanced ideas or applications. [ksa]
- g. Is able to reflect on standard methods and their presuppositions; is able to question these; is able to propose adjustments, and to estimate their implications. [ksa]
- h. Is able (with supervision) to spot gaps in his / her own knowledge, and to revise and extend it through study, independently. [ks]

MSc-II Competent in doing research

The Aerospace Engineering graduate has the competence to acquire new scientific knowledge through research. For this purpose, research means: the development of new knowledge and new insights in a purposeful and methodical way.

- a. Is able to reformulate ill-structured research problems in multi-disciplinary context such as Aerospace Engineering. Also takes account of the system boundaries in this. Is able to defend the new interpretation against involved parties, for problems of a more complex nature. [ksa]
- b. Is observant, and has the creativity and the capacity to discover in apparently trivial matters certain connections and new viewpoints and is able to put these viewpoints into practice for new applications. [ksa]
- c. Is able to produce and execute independently a research plan. [ks]

- d. Is able to work at different levels of abstraction. Given the process stage of the research problem, chooses the appropriate level of abstraction. [ksa]
- e. Understands, where necessary, the importance of other disciplines (interdisciplinarity). Is able, and has the attitude to, where necessary, draw upon other disciplines in his or her own research. [ksa]
- f. Is able to deal with the changeability of the research process through external circumstances or advancing insight. Is able to steer the process on the basis of this. [ksa]
- g. Is able to assess research within a particular field of Aerospace Engineering on its scientific value. [ksa]
- h. Is able to independently contribute to the development of scientific knowledge in one or more areas of the disciplines involved in a particular field of Aerospace Engineering. [ksa]

MSc-III Competent in designing

The Aerospace Engineering graduate is familiar with the principles of design. Designing is a synthetic activity aimed at the realization of new or modified artifacts or systems with the intention of creating value in accordance with predefined requirements and desires (e.g. mobility, health).

- a. Is able to reformulate ill-structured design problems in the field of Aerospace Engineering. Also takes account of the system boundaries in this. Is able to defend this new interpretation against the parties involved for design problems of a more complex nature. [ksa]
- b. Has creativity and synthetic skills with respect to multi-disciplinary design problems, such as they occur in the field of Aerospace Engineering. [ksa]
- c. Is able to independently produce and execute a design plan. [ks]
- d. Is able to work at different levels of abstraction including the system level. Given the process stage of the design problem, chooses the appropriate level of abstraction. [ksa]
- e. Is able, and has the attitude, where necessary, to draw upon other disciplines in his or her own design. [ksa]
- f. Is able to deal with the changeability of the design process through external circumstances or advancing insight. Is able to steer the process on the basis of this. [ksa]
- g. Is able to formulate new research questions on the basis of a design problem. [ks]
- h. Has the skill to take design decisions, and to justify and evaluate these in a systematic manner. [ksa]

MSc-IV A scientific approach

The Aerospace Engineering graduate has a systematic approach characterized 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.

- a. Is able to identify and take in relevant developments in a particular field of Aerospace Engineering. [ksa]
- b. Is able to critically examine existing theories, models or interpretations in the area of his or her graduation subject. [ksa]
- c. Has great skill in, and affinity with the use, development and validation of models; is able to consciously and conscientiously choose between alternative modeling techniques. [ksa]
- d. Has insight into the nature of science and technology (purpose, methods, differences and similarities between scientific fields, nature of laws, theories, explanations, role of the experiment, objectivity etc.) and has knowledge of current debates about this. [k]
- e. Has insight into the scientific practice (research system, relation with clients, publication system, importance of integrity etc.) and has knowledge of current debates about this. [k]
- f. Is able to document adequately the results of research and design with a view to contributing to the development of knowledge in the field and beyond and is able to publish these results. [ksa]

MSc-V Basic intellectual skills

The Aerospace Engineering graduate is competent in reasoning, reflecting, and forming a judgment. These are skills which are learned or sharpened in the context of a discipline, and which are generically applicable from then on.

- a. Is able (with supervision) to critically reflect on his or her own thinking, decision-making, and acting and to adjust these on the basis of this reflection, independently. [ksa]
- b. Is able to reason logically within the field and beyond; both 'why' and 'what-if' reasoning. Is able to recognize fallacies. [ks]
- c. Is able to recognize modes of reasoning (induction, deduction, analogy etc.) within the field. Is able to apply these modes of reasoning. [ksa]
- d. Is able to ask adequate questions, and has a critical yet constructive attitude towards analyzing and solving more complex (real-life) problems in the field . [ksa]
- e. Is able to form a well-reasoned opinion in the case of incomplete or irrelevant data and taking account of the way in which that data came into being [ks]
- f. Is able to take a standpoint with regard to a scientific argument in the field of aerospace (engineering) sciences and is able to assess this critically as to its value. [ksa]
- g. Possesses basic numerical skills, and has an understanding of orders of magnitude. [ksa]

MSc-VI Competent in cooperating and communicating

The Aerospace Engineering graduate has the competence of being able to work with and for others. This requires not only adequate interaction, a sense of responsibility, and leadership, but also good communication with colleagues and non-colleagues. He or she is also able to participate in a scientific or public debate.

- a. Is able to communicate in writing about research and solutions to problems with colleagues, non-colleagues and other involved parties. [ksa]
- b. Is able to communicate verbally about research and solutions to problems with colleagues, non-colleagues and other involved parties. Is able to do so in second language. [ksa]
- c. Is able to debate about both the Aerospace Science and Technology and its place in society. [ksa]
- d. Is characterized by professional behaviour, showing flair in performing experimental and other project work. This includes: drive, reliability, commitment, accuracy, perseverance and independence. [ksa]
- e. Is able to perform project-based work: is pragmatic and has a sense of responsibility; is able to deal with limited sources; is able to deal with risks; is able to compromise for more complex problems [ksa]
- f. Is able to work within an interdisciplinary team and for a team with great disciplinary diversity. [ksa]
- g. Has insight into, and is able to deal with, team roles and social dynamics. Is able to assume the role of team leader. [ks]

MSc-VII Takes account of the temporal and societal context

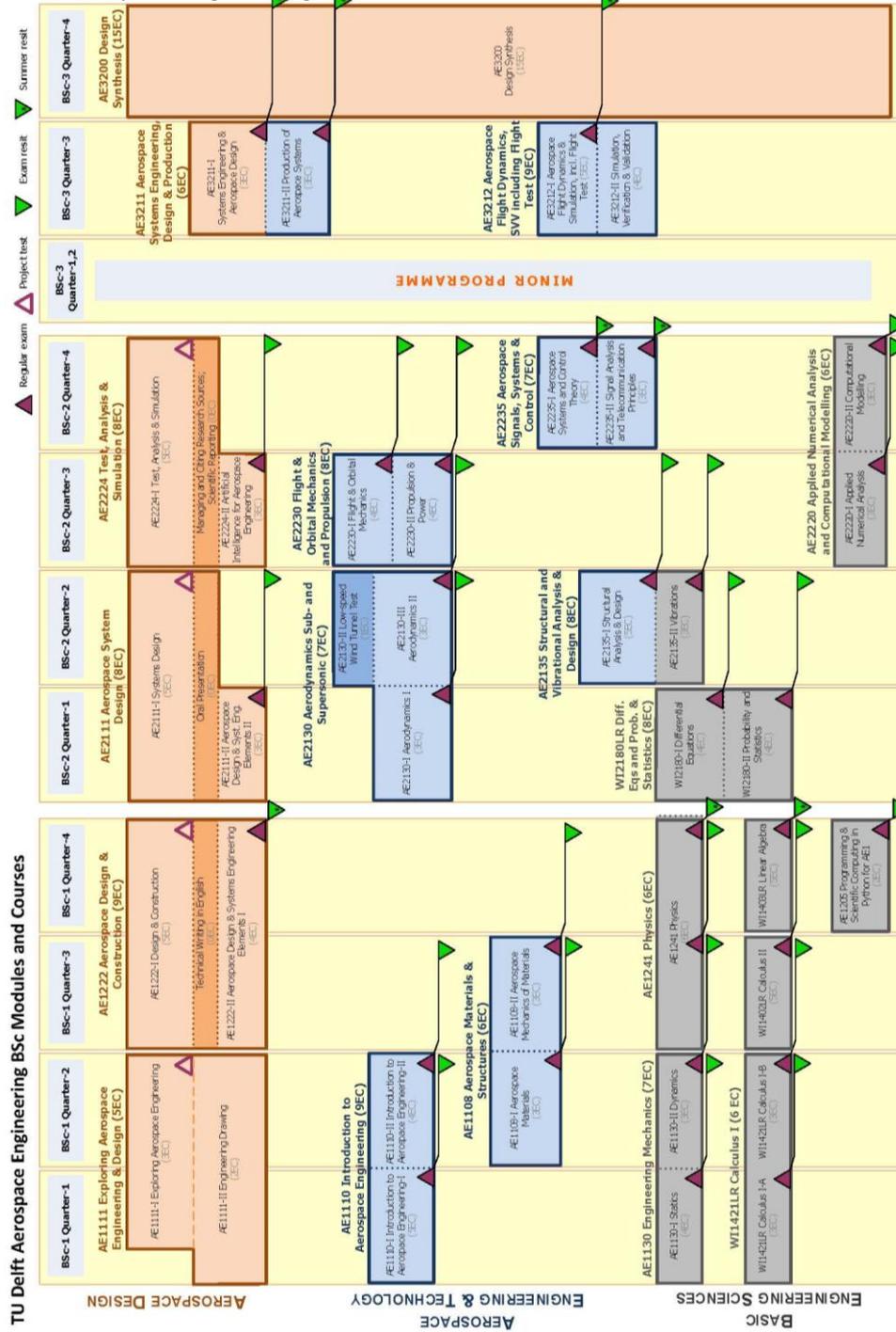
Aerospace science and technology are not isolated, and always have a temporal and societal context. Beliefs and methods have their origins; decisions have societal consequences in time. The MSc graduate is aware of this and therefore has knowledge and understanding of the context in which Aerospace Engineering and utilization is practiced by industry, institutes and organizations. He or she has the competence to integrate these insights into his or her work.

- a. Understands relevant (internal and external) developments in the history of aeronautics and spaceflight. This includes the interaction between the internal developments (of ideas) and the external (societal) developments, both national and international. Integrates aspects of this in scientific work [ksa]
- b. Is able to analyse the societal context of the Aerospace industry (economic, social, cultural) and the consequences of new developments and applications of aerospace science and technology and to discuss these with colleagues and non-colleagues. Integrates aspects of this in scientific work. [ksa]

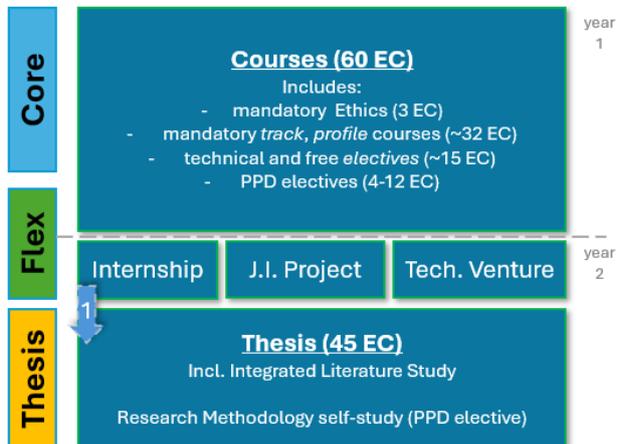
- c. Is able to analyse the consequences of scientific thinking and acting on the environment and sustainable development. Integrates aspects of this in scientific work. [ksa]
 - d. Is able to analyse and to discuss the ethical, safety and aesthetic aspects of the consequences and assumptions of scientific thinking and acting in the domain of Aerospace Engineering with colleagues and non-colleagues (both in research and in designing). Integrates these ethical and normative aspects in scientific work. [ksa]
- Has an eye for the different roles of the “actors” in the fields of Aerospace Engineering, Technology and Space Sciences. Chooses a place as a professional in society. [ksa]

Annex 5: Curriculum

BSc Aerospace Engineering modules and courses



Generic outline of the Master's programme following MSc Vitalization (CFT-design).



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