

ME | Points of improvements in response to the Accreditation 2018

On the 10th of December 2018, Mechanical Engineering (BSc and MSc) was visited by an independent committee. This committee consists of experts in the field and was appointed to check the quality of the mechanical engineering programmes at the University of Twente, TU Delft and TU Eindhoven to check the quality of the study programme. This process of programme visitation and accreditation takes place every 6 years. Reports are made of the visitation and the development dialogue that takes place afterwards. These reports are important for the academic accreditation of the study programme from the government by the Dutch-Flemish Accreditation Organisation (NVAO), but are also very important for the continuous development and improvement of Mechanical Engineering (BSc and MSc) The University of Twente works with a bottom-up approach when it comes to quality assurance and improvement of the study programmes. The students themselves have of the opportunity to influence the development and improvement of their own education. To facilitate students, teachers and anyone who directly contributes to education to participate in improving the quality of Mechanical Engineering (BSc and MSc), the visitation committee's findings are listed below.

Mechanical Engineering (BSc); points for improvement from the visitation report:

Standard 1	Intended learning outcomes (The intended learning outcomes of the programme have been concretised with regard to content, level and orientation; they meet international requirements)
Assessment:	Satisfactory
Substantial findings:	-
Advise:	The panel thinks that the intended learning outcomes could be phrased more specifically to the domain of mechanical engineering; thus, they would give even more direction to the construction of the courses and the curriculum.
Reaction of the Programme:	The intended learning outcomes are currently quite generic and provide little guidance. The programme must do something about that. This will not create internal difficulties; the comment is understood by the programme and it is addressed. We have the same intended learning outcomes as Delft and Eindhoven. A relationship is seen with the education sector plans and new ideas that are available. If these are new tracks or courses, the learning outcomes must be sufficiently broad to cover them. So, this point is recognizable and will be dealt with.
Standard 2	Teaching-learning environment (The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes)
Assessment:	Good
Substantial findings:	The panel finds the alignment between the intended learning outcomes and the curriculum to be very good. It is very positive about TOM and the project-based learning that structures the curriculum. Overall, the programme is very well-organised, taking student's learning of both disciplines and skills seriously. The panel is very positive about the way the teaching staff is involved in the mentor system in the first year. It also supports the Faculty's policy to attract more female teaching staff.
Advise:	The panel appreciates that the management wants to preserve the personal approach to students despite growing student numbers. It recommends paying close attention to the increasing workload of the teaching staff.

Reaction of the programme:	This is more of a recommendation. Attention is already paid to preserving the personal approach while keeping in mind the workload of teaching staff and the programme will continue to do so. It is not easy, but it is considered very important. The basic principle of all choices is that quality and personal approach are very important. This is also linked to the educational philosophy and is appreciated by students. There is no further advice on how to do it. Every year, we talk to all module teams to find out with which number of students the programme may get into trouble and how this can be solved. Suggestions are; student assistants, adjustment of educational methods, using more/different materials. Attempts are also being made with e-learning to leave more time for 1-1 contact with students. The expansion of study advisers is also an asset, especially with international students. If we want to maintain the current educational approach, there is an upper limit. There is a social obligation to train ME students in a way that society demands for. But the solution could also be to have a bachelor's degree in Amsterdam or set up a societal engineering programme to attract more female students.
Standard 3	Assessment (The programme has an adequate assessment system in place)
Assessment:	Good
Substantial findings:	The panel finds the assessment policy to be very well documented and transparent. It also ascertained that there are assessment forms in place, which are very well elaborated and used by the teaching staff. The panel established that the Examination Board is performing its legal duties and responsibilities diligently and was impressed by its strong involvement in the assurance of the assessment quality.
Advise:	-
Standard 4	Achieved learning outcomes (The programme demonstrates that the intended learning outcomes are achieved)
Assessment:	Good
Substantial findings:	It found the level of the bachelor assignments to be good and in particular liked the societal reflection elements included.
Advise:	-
General conclusion	Good

Mechanical Engineering (BSc); points for improvement from the visitation report:

Standard 1	Intended learning outcomes (The intended learning outcomes of the programme have been concretised with regard to content, level and orientation; they meet international requirements)
Assessment:	Satisfactory
Substantial findings:	-
Advise:	The panel thinks that the ILOs could be made more specific to the domain of mechanical engineering; thus, they would give even more direction to the construction of the courses and the curriculum.
Reaction of the programme:	This advice is the same as the advice for the Bachelor and the answer is also comparable.
Standard 2	Teaching-learning environment (The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes)
Assessment:	Satisfactory
Substantial findings:	The structure of the curriculum is clear, and there is a good connection between the research in the department and the specialisations for the master students. The panel finds the curriculum to be good and comparable to the curricula of other engineering master's programmes. The quantity and the quality of the teaching staff are good.
Advise:	Students, staff and the professional field are positive about the position of the internship in the master's programme, but the panel thinks that the added value of the internship in the programme could be better defined. It appreciates that the management wants to preserve the personal approach to students, despite growing student numbers. It recommends monitoring the increasing workload of the teaching staff.
Reaction of the programme:	This point is not so much recognized by the study programme. The programme has refined the criteria for assessing the internship. However, these criteria could also be refined for the selection of internship assignments. The criteria for this must be written in advance and it must be clear what criteria the assignment must meet. The assessment criteria and the intended learning outcomes are clear. The feedback on the growing student numbers is the same as for the bachelor's programme and the answer is also similar.
Standard 3	Assessment (The programme has an adequate assessment system in place)
Assessment:	Good
Substantial findings:	The panel established that the master's programme Mechanical Engineering has a good quality assurance system. It finds the assessment policy to be very well documented and transparent.
Advise:	The panel has some questions concerning the assessment and quality assurance of the internships and advises the programme to develop clear criteria for the selection of internship positions in order to be sure that all students can achieve the intended learning outcomes for this part of the master's programme.
Reaction of the programme:	See reaction at standard 2
Standard 4	Achieved learning outcomes (The programme demonstrates that the intended learning outcomes are achieved)
Assessment:	Good

Substantial findings: The panel found the level of the master's theses to be very good and would have graded most theses higher than the graduation committee.

Advise: -

General conclusion Good

In response to the visitation the programme management discussed all results and points of improvements (of Bachelor and Master) with the Rector. The Programme Director will use these outcomes in his programme development plan.

Outcomes of the development dialogue with the panel (BSc and MSc):

During the development dialogue with TU Delft and TU Eindhoven four issues were discussed:

1. *How to deal with growing student numbers without losing the personal approach and integrated project education?*

For the Executive Board, this is linked to the educational philosophy and the good approach to safeguard it. On the one hand, the University has a social mission to fulfil and, on the other hand there is our educational philosophy. The advice was to assign students to a specialization based on a motivation letter, but this does not suit the UT. Students should be free to do the specialisation of their choice. We now have 7 specializations instead of 5, which are organized from different departments. Our philosophy is to address people on their own motivation. We notice that it spread orally when there are fun assignments or good supervisors, so that many students will choose a department. We try to counteract this by involving the various departments in all specializations.

2. *Limit the study duration in the master*

This is an important aspect. For both education and graduation supervisor it is nice to see if a graduation project produces a concrete result. This is also the case with PhD graduation. The rector sees it as a social duty to limit the study duration in the Master. Also, towards students, otherwise they outgrow their generation. For international students it is not a possibility to delay since this is financially not feasible.

The subject is also added to the agenda in the Chamber of Professors. It has to do with a student's autonomy. People do not feel part of a system and want optimal freedom. We must continue to emphasize that this is an important issue.

International staff member seems to be more accustomed to stricter time constraints. It also lowers the workload. The programme continues the process to realize the culture change, but it cannot be done overnight. Perhaps longer projects can be set up on which students vary, but the project continues, and students can still complete their own part of the project and graduate. Agreeing on a final deadline for the MSc thesis could also help. If there is a delay of more than 3 months, a student should request permission from the Examination Board to continue their assignment. Another option is that students do not pass if there is a delay of more than 3 months.

3. *How much knowledge of computer science and automation do our ME students need?*

This is related to development in the field. It was a casual conversation. There is now a new professor who is working on Machine Learning and a specialization is being organized with Robotics. The programme management will discuss this in the meeting with educational staff and whether knowledge of other disciplines is required. The UT also tries to work interdisciplinary.

The programme needs to know the developments within the working field and how to connect with them.

4. *What does the ideal mechanical engineering programme look like? Which elements from various programmes should be combined to obtain the ideal program?*

With all developments going on we must be careful to become too narrow and too specialistic. Of course, you need specialization, but a student can do that himself. On the one hand we should not be too wide and on the other hand not too narrow. The most important thing is that students learn to acquire and apply new knowledge to themselves. And that they can do this at sufficient depth.