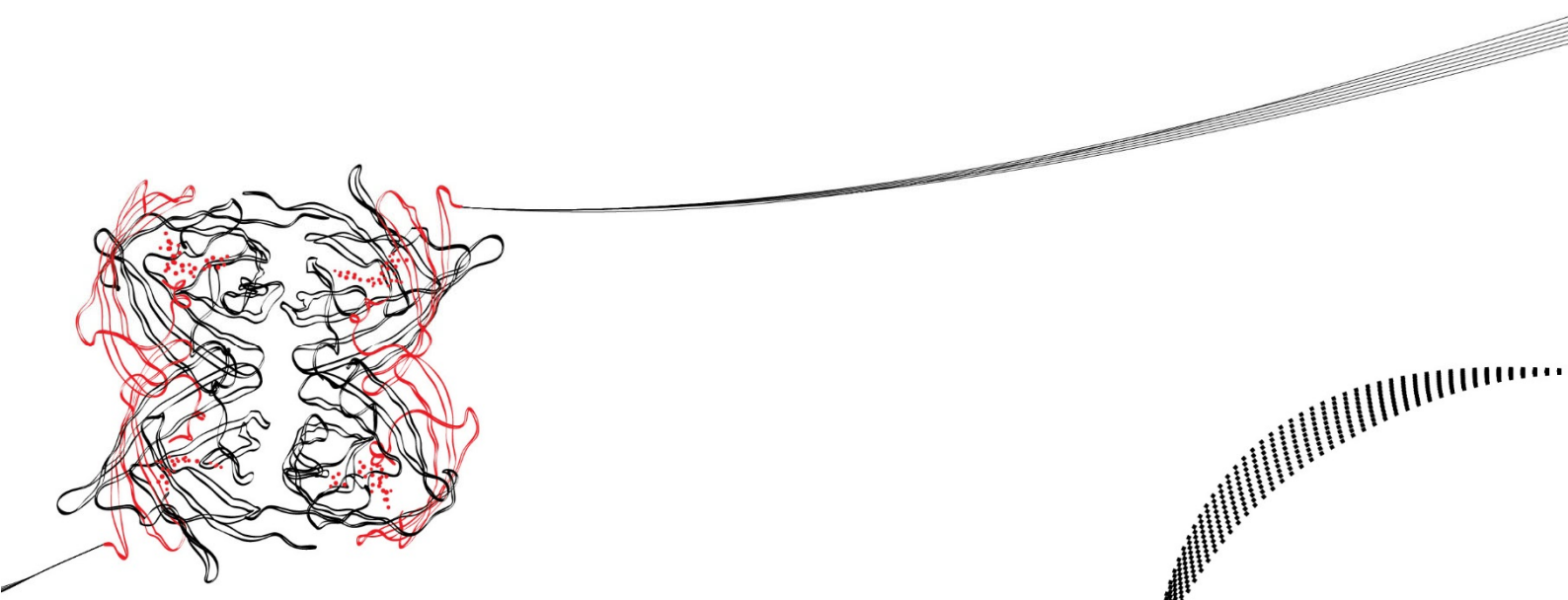
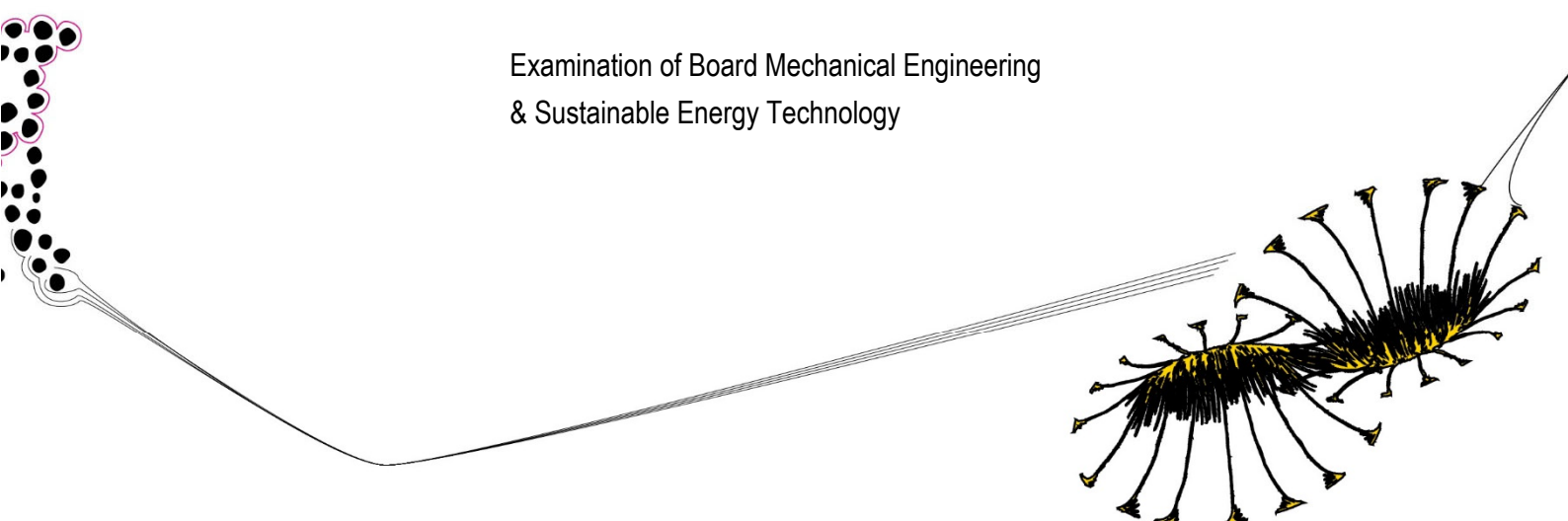




# ANNUAL REPORT 2022-2023

Examination of Board Mechanical Engineering  
& Sustainable Energy Technology



# COLOFON

EXAMINATION BOARD  
Mechanical Engineering & Sustainable Energy Technology

DATE  
20-Feb-2024

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# PREFACE

As laid down in the *Wet op het hoger onderwijs en wetenschappelijk onderzoek*—i.e. the *Dutch Act on Higher Education and Scientific Research* (WHW 7.12b-5), the Examination Board of the BSc & MSc programs *Mechanical Engineering* (ME) and the MSc program *Sustainable Energy Technology* (SET), as part of the *Faculty of Engineering Technology* (ET) of the University of Twente, is required to annually report her activities.

In this annual report, the Examination Board ME/SET summarizes and accounts for its activities over the academic year 2022-2023.

The Examination Board ME/SET defines the function of its annual reports as one of the means in a *Plan-Do-Check-Act* (PDCA) cycle. This annual report is based on factual and verifiable information, but not traceable to individuals.

## ABBREVIATIONS

B1, B2, B3	First, second and third year Bachelor program, respectively
BSA	Bindend studieadvies - binding study recommendation (in 1 <sup>st</sup> yr BSc programme)
BSc	Bachelor of Science
CELT	Centre of Expertise in Learning and Teaching (of the University of Twente)
CROHO	<i>Centraal Register Opleidingen Hoger Onderwijs</i> — Central Register of Higher Education Programs
EC	European Credits as defined in the ECTS
ECTS	European Credit Transfer and Accumulation System
EEMCS	Faculty of Electrical Engineering, Mathematics and Computer Science
EER	Education and Examination Regulation
ET	Faculty of Engineering Technology
EWI	<i>Faculteit Elektrotechniek, Wiskunde en Informatica</i> – Faculty EEMCS
FQ	Final Qualification
ILO	Intended Learning Objective
ISAT	<i>Interuniversitair Statistisch Advies Team</i> –i.e. a no longer active team which coined the abbreviation ISAT; a registration number (code) to identify a Dutch educational program
ME	Mechanical Engineering
MSc	Master of Science
NVAO	<i>Nederlands-Vlaamse Accreditatieorganisatie</i> – Accreditation Organisation of the Netherlands and Flanders
PDCA	Plan-Do-Check-Act
SET	Sustainable Energy Technology
SUEQ	Senior University Examination Qualification
UT	University of Twente
VU	Vrije Universiteit Amsterdam
ME UT-VU	Co-location of the BSc ME program at the Vrije Universiteit (VU) Amsterdam
WHW	<i>Wet op het hoger onderwijs en wetenschappelijk onderzoek</i> – (The Dutch Act on) Higher Education and Scientific Research Act

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# 1 GENERAL

## 1.1 Programs under the responsibility of the Examination Board ME/SET

The examination board Examination Board ME/SET is responsible for the educational programs

- Bsc Mechanical Engineering in Enschede, with co-location at the VU Amsterdam (ISAT code in CROHO: 56966),
- Msc Mechanical Engineering in Enschede (ISAT code in CROHO: 60439) and
- MSc Sustainable Energy Technology (ISAT code in CROHO: 60443).

## 1.2 Members of the Examination Board and those involved

In the period September 2022 up to including August 2023, the Examination Board ME/SET was composed of the following members (in alphabetical order):

- drs. M. de Haan (external member)
- dr. J.C.J. Koelemeij (member, as of Jan. 1<sup>st</sup>, 2023; VU representative)
- dr.ir. A.K. Pozarlik (vice-chairman; SET representative)
- Prof. dr. A.C.M. Ran (member, until Sept. 2022; VU representative)
- prof.dr.ir. G.R.B.E Römer (chairman)
- Prof. dr. ing. B. Rosic (member)
- ir. M.P. Zwier (secretary)

Advisers of the Examination Board ME/SET were/are (in alphabetical order):

- K.G.M. Braakhuis LLM (program coordinator MSc SET)
- ir. M.J.B. Duyvestijn (study advisor MSc ME & SET)
- drs. E.M. Gommer (program director BSc & MSc ME, as well as of MSc SET)
- A. Hendriks (study advisor and coordinator ME UT-VU)
- A.F. Heutink (program coordinator MSc ME)
- ir. E.C.M. Luijkx (pre-master coordinator ME)
- drs. D.A.C. Paquaij (study adviser BSc ME year 1)
- ir. M. Rijkeboer (program manager ME Enschede & ME UT-VU)
- dr.ir. G.G.M. Stoffels (program coordinator BSc ME)
- R. van der Stigchel (coordinator internships MSc M & MSc SET)
- dr.ir. J.P. Schilder (location director ME UT-VU)
- J.C.T. de Schutter, MSc (study advisor and coordinator ME UT-VU)
- ir. J.E. van der Werf (study adviser BSc ME year 2 & 3)

The Examination Board ME/SET was supported in administrative matters by:

- S.H.J Steinmeijer (minutes)

## 1.3 Capacities, tasks and responsibilities of the Examination Board

As laid down in the Dutch Act on Higher Education and Scientific Research (WHW, article 7.12), capacities, tasks and responsibilities are assigned to the Examination Board of ME/SET and is appointed by the dean of the Faculty of Engineering Technology (ET). Additional capacities, tasks and responsibilities of the Examination Board ME/SET are laid down in the Education and Examination Regulations (EERs) of the (BSc and MSc) ME programs and of in the EER of the MSc SET program. As such, the Examination Board determines whether a student meets the Final Qualifications (FQs) of the ME and SET programs and therefore can safeguard the quality of the diplomas of programs.

The capacities, tasks and responsibilities of the Examination Board ME/SET include, but are not limited to:

- quality assurance of exams test plans,
- appointment of examiners,
- decisions regarding requests of students regarding an individual course program, or a deviating course program, based on and in accordance with rules in the EER,
- signing diploma's,
- establishing and monitoring Binding Study recommendation (BSA) of first year students,
- handling requests and complaints of students (see section 2.2),
- handling (suspected) fraud cases (see section 2.2).

#### 1.4 Mandates

The Examination Board has delegated well defined tasks to other officials in the organization of the Faculty of Engineering Technology (ET) and the University of Twente (UT), to handle standard (student) requests, complaints and situations that require standard and quick decisions. Mandates are documented in writing and archived. All decisions made by mandated staff are presented and discussed by the secretary at the meetings of the Examination Board by means of a "decision list". All non-mandated decisions are made by the Examination Board.

#### 1.5 Documentation and archiving

Minutes, agenda's, and other documents, such as mandates and decisions of/by the Examination Board are archived by the secretary of the Examination Board on the shared computer P-drive (server) of the University of Twente, with restricted access only for members of the Examination Board. Decisions of the Examination Board are documented either in the minutes of the meetings of the of the Examination Board or in the so-called "decision list" (see section 1.3). Also, this list is archived.

#### 1.6 Website

General information of the Examination Board, such as its members, rules and guidelines which are in place, guidelines for lecturers, annual reports, as well as guidelines on how to approach the board, are published at: <https://www.utwente.nl/en/bscme/organisation/Examination%20Board/>

## 2 ACTIVITIES OF THE EXAMINATION BOARD

*This section provides a brief overview of a few major advisory and policy-related tasks that the Examination Board, in addition to its regular tasks, fulfilled in academic year 2022-2023.*

### 2.1 Meetings

In the period September 2022 up to and including August 2023, The Examination Board ME/SET had 6 regular meetings, namely in 2022 on Dec. 5<sup>th</sup> and in 2023 on Jan. 30<sup>th</sup>, Mar. 20<sup>th</sup>, May 8<sup>th</sup>, Jun. 19<sup>th</sup>, and Aug. 28<sup>th</sup>.

Meetings have taken place in hybrid form-i.e. face-to-face using the on-line platform MS TEAMS, for logistic/practical reasons.

### 2.2 Last effects of the Covid-19 pandemic and decisions to mitigate its effects

The Covid-19 pandemic also had a large effect on how the Examination Board ME/SET shaped and performed her responsibilities (see section 1.2), in the period January 2021 up to and including August 2022. That is, some strict rules, as laid down, in, for example, Education and Examination Regulations (EERs) of the (BSc and MSc) ME programs and of in the EER of the MSc SET program, have been relaxed, in order to mitigate unreasonable effects (such as too long delays) on students, due to governmental- and/or or institutional measures (e.g. lockdown) to fight the spread of the Corona-virus. Rules were only “relaxed” when the Examination Board ME/SET could/can still safeguard the quality of exams and the diplomas of the programs.

In academic year 2022-2023, except for two, nearly all changes to the rules were rolled back. That is, in Oct. 2022 a few last extra resits, for students affected by Covid-19 pandemic, were offered in BSc ME Module 4 and 8. And, only up to and including Feb. 2023, the so-called “*zachte knip BSc-MSc*”—i.e. a BSc student, who nearly completed his/her BSc program, is conditionally admitted to the MSc program— was applied. As of March 2023, all original rules were “back in place”.

### 2.3 Student request, complaints and cases of fraud

During academic year 2022-2023 the Examination Board has handled multiple student requests, including but not limited to requests for extra examinations or resits, requests for an exemption and requests for a non-standard study-program. In total 252 “cases” were handled. Table 1 below lists an overview of the cases handled. This table also lists a number of fraud cases and complaints, which have been dealt with. Fraud cases as well as complaints can involve groups of students. In those instances, a case is listed as a single case in the table.

The last column in the table lists the increase (+) or decrease (-) of the number of cases handled, relative to the number of cases handled in the period January 2021 up to and including August 2022, as reported in the previous annual report of the Examination Board. Drawing statistical conclusions from the comparison of the (number of) cases in the period from January 2021 up to and including August 2022, to the cases handled in the period from September 2021 up to and including August 2023, is challenging because the first period covers 20 months, whereas the latter period covers 12 months. However, on average, in the period January 2021 up to and including August 2022 (20 months) the Examination Board handled 7,8 cases per month; whereas in academic year 2022-2023 (12 months) this increased significantly to 21 cases per month. This increase can only partly be attributed to “lagging effects” of the Covid-19 pandemic, see section 2.2.

The increase of fraud cases handled is worrying. Therefore, the Examination Board is collaborating with the program management to increase/improve the measures to prevent fraud by students.

The number of MSc students requesting an extension of the duration of their MSc assignment/thesis also shows a significant increase. This is the result of joint efforts of the Examination Board and the program management to reduce the number of students exceeding the standard duration of a MSc assignment/thesis.

Last but not least, like was observed in previous academic years, the Examination Board observes, that students are more assertive. That is, students “know to find” the Examination Board for requests and complaints, etc.

To cope with the significant case load, the Examination Board has requested administrative support (registrar) from the Faculty of Engineering Technology.

Table 1. Overview of requests, complaints and fraud cases dealt by the Examination Board

Category	Sub-category	Total no. cases	No. of cases approved	No. of cases declined	No. of cases no decision or other	Increase or decrease**
Complaints (3 students involved)		4	0	3	1	+3
Fraud* (27 students involved)		33	15	10	8	+27
Requests for adaptation of individual course programs	non-standard course list for the master and pre-master	5	4	1	0	+0
	double master	5	5	0	0	+4
	replace internship with courses/work experience	3	2	0	1	+2
	adjusted bachelor (minor etc.)	14	14	0	0	+12
	other	6	3	1	2	+6
Requests for changed planning	start master assignment before finishing courses	12	7	2	1	+8
	start VU-ME bachelor assignment before finishing courses	5	0	3	2	+2
	extension thesis	39	35	3	1	+27
	start internship before finishing courses	2	2	0	0	+4
	other planning issues	6	3	3	0	+5
Requests for admission	to master, pre-master, double master	0	0	0	0	+0
	"zachte knip" bachelor-master/other	0	0	0	0	+0
Requests for examinations	extra resits	28	16	12	0	-10
	double exam	8	8	0	0	+3
	remote examination/special facilities	4	4	0	0	+3
	other	1	0	1	0	+0
Requests regarding graduation	Non-standard cum laude request	0	0	0	0	-3
	Request for graduation BSc and MSc testimony	0	0	0	0	+0
	Non-standard Msc graduation committee	3	2	0	1	-1
	Other	10	7	2	0	+7
Requests for exemptions	exemption courses bachelor and pre-master	9	6	1	2	+2
	entrance requirement minor, Module 8 or bachelor assignment	55	26	26	3	+1
	other (a.i. BSA)	0	0	0	0	-2
Total:		<b>252</b>	<b>159</b>	<b>68</b>	<b>22</b>	

\* Fraud cases can involve groups of students, e.g. project groups. In those instances, a case is listed as one case in the table.

\*\* Relative increase, in the 12 month period from September 2022 up to and including August 2023, of the number of cases handled, compared to the 20 month period January 2021 up to and including August 2022.



## 2.4 BSc Mechanical Engineering at VU Amsterdam

In September 2019 the University of Twente and the Vrije Universiteit (VU) Amsterdam started a co-location of the BSc program in Mechanical Engineering hosted at the VU campus in Amsterdam. The responsibilities of the Examination Board ME/SET also encompass the examinations and student affairs of this program in Amsterdam; see the annual report of the Examination Board ME/SET of 2019 for details.

As both programs have the same ISAT code in CROHO, complaints and requests by students in Enschede and in Amsterdam are (to be) handled in a uniform way by the Examination Board ME & SET. Such an approach is facilitated by the fact that the rules that govern the ME programs at both sites have been well harmonized overall. Occasionally, however, the rules are found to differ in certain details. For example in the maximum allowed duration of exams, which is shorter at VU than in Enschede. Such discrepancies, if they arise, are dealt with by the Examination Board ME & SET in a practical way, to avoid different treatment of students at either location. At the same time, as a solution for the long term, further harmonization is sought by pointing out the issue, and suggesting appropriate modifications to the EER, to the Program Manager(s).

Given the responsibilities of the Examination Board ME & SET for the joint ME program at VU Amsterdam, the Examination Board ME & SET is composed of one or more members who are affiliated with VU and active in one of the programs covered by the Examination Board. As of January 1, 2023, Dr. J.C.J. (Jeroen) Koelemeij of VU (and teacher in the joint ME program at VU) was appointed member of the Examination Board. In his new role as VU-affiliated Board member, Dr. Koelemeij is the successor to his VU colleague Prof. dr. A.C.M. (André) Ran who retired from the Examination Board ME/SET in 2022.

## 2.5 MSc Sustainable Energy Technology (SET)

Mid 2023 a formal accreditation of the MSc SET programme (ISAT code in CROHO: 60443) took place. To that end, the program management conducted and coordinated a self-evaluation of the program, including all relevant bodies within the program (program management, Program Committee, Examination Board, lecturers, etc.), as well as collected feedback on the program from (former) students enrolled in SET, as well as industry. Four standards were evaluated:

1. Intendent Learning Outcomes,
2. Teaching-learning Environment,
3. Student Assessment and
4. Achieved Learning Outcomes.

This self-evaluation was accessed by a independent peer review panel, of which the composition was approved by the *Nederlands-Vlaamse Accreditatieorganisatie* (NVAO). In addition, on June 27<sup>th</sup>, 2023, this panel interviewed the abovementioned bodies and (former) students, on site. The Examination Board ME & SET was interviewed on the overall safeguarding of the quality of the examinations and in particular to Standard 4 (Student Assessment).

Their findings and recommendation were laid down in reports<sup>1,2</sup>. Overall the panel positively evaluated/assessed all four Standards (see above). With respect to Standard 4 the panel concluded that, all assessment procedures are strictly monitored by the Examination Board ME & SET. Furthermore, it was concluded that<sup>1</sup>: *the Board is professional and fulfills all its legal duties in an appropriate way. There is a solid system of checks and balances. The regular checks of courses, internship reports and graduation projects provide the Board with a solid view on assessment quality in SET and the exit level of students.*

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<sup>1</sup> Academion, Report SET, MSc Sustainable Energy Technology, University of Twente, September 25, 2023

<sup>2</sup> Academion, Development report SET, MSc Sustainable Energy Technology, University of Twente, September 25, 2023.

The panel also evaluated the assessment (procedure) of MSc SET theses, which include assessment of the performance of the student on five aspects: (i) Quality of Research or Design, (ii) Report, (iii) Working Process during the Master Assignment, (iv) Oral presentation and (v) Defense. The panel concluded that the procedure is appropriate and the assessment criteria for MSc theses are well-defined and coherent. The panel pointed out that the procedure can be improved by providing more written feedback and recommendations to the student in the assessment form of the MSc assignment/thesis.

Overall it was concluded that the SET programme has implemented a: *solid assessment system that promotes reliable, valid and transparent student assessment*<sup>1</sup>.

A point of attention brought forward by the panel, with respect to the responsibilities of the Examination Board, is to improve the information to student on assessment criteria (of study units) to students.

Additionally, it was pointed out that for the SET programme, which is relatively small in terms of the number of enrolled students, compared to the BSc and MSc ME programmes, a separate—i.e. independent, Examination Board dedicated to SET programme only, is not deemed efficient.

## 2.6 Participation in UT Platform Examination Boards

The chair of the Examination Board ME & SET participates in meetings of the University wide *Platform of Examination Boards*. This platform regularly discusses best practices of/for Examination Boards, as well as aims at harmonizing rules and guidelines of examinations and quality assurance, which overarch the various educational programs at the University of Twente. In 2022, the platform started a discussion, also including the rector magnificus of the University of Twente, prof. A. Veldkamp (Tom), reflecting on the status of the platform, and whether it should get a more formal role.

## 2.7 Diplomas and cum laude

Table 2 lists the number of students who were awarded a BSc or MSc degree (diploma), as well as the number of students who graduated *cum laude*—i.e. a degree “with distinction”. The Examination Board ME & SET targets that 5% to 10% of the student are awarded a degree “with distinction”. Variations over the various academic years is not alarming and can mostly be attributed to a low number of students enrolled in the individual programmes in some years.

*Table 2: Number of degrees (diplomas) and degree with distinction (incl %)*

	Bsc ME			MSc ME			MSc SET		
	Diplomas	Cum laude (%)	Total	Diplomas	Cum laude (%)	Total	Diplomas	Cum laude (%)	Total
2018	80	4 (4,8%)	84	119	8 (6,2%)	127	13	3 (18,7%)	16
2019	73	0 (0%)	73	145	7 (4,6%)	152	20	2 (9%)	22
2020	81	3 (3,6%)	84	129	6 (4,4%)	135	37	3 (7,5%)	40
Jan. 2021- Aug. 2023	102	6 (5,5%)	108	128	2 (1,6%)	30	30	2 (6,3%)	32
Sep. 2022- Aug. 2023	106	4 (3,6%)	110	118	11 (8,5%)	129	27	2 (6,9%)	29

## 2.8 Improving the skills and expertise of the Examination Board

Drs. M. de Haan (external member of the Examination Board) successfully completed the Senior *University Examination Qualification* (SUEQ) program of the University of Twente in 2020. The SUEQ program is aimed at, amongst others, members of the Examination Boards. Dr. Pozarlik and ir. Zwier (both members of the Examination Board) are currently enrolled in the SUEQ program. Together, they will use the knowledge obtained in the SUEQ program for further improvements of the quality assurance by evaluation of rules and procedures in place in the programs of ME and SET, as well as to continue the Board's process of test-quality assessments (e.g. by participating and working together with the other members of the examination board and the teachers on the evaluation of tests).

In March 2023, the Examination Board ME & SET initiated a coordinated, together with the Faculty Board, a training of (governing) bodies in the he programs ME & SET (incl. but not limited to Program Committee, Program Management, Faculty Board, Faculty Council, Examination Board, MSC & MSC coordinators) by an external consultancy (TAQT). The training was aimed at clarifying (once more) the tasks & responsibilities of the bodies, as well as discuss improvements on various procedures.

# 3 SELF-EVALUATION & OUTLOOK

*Each year the ME / SET Examination Board evaluates its own functioning and formulates aspects to work on for the next (academic) year.*

## 3.1 Self-evaluation 2022-2023

In May 2023, in a meeting, the Faculty Board, represented by prof. Koopman (Bart) and prof. M.C. van der Voort (Mascha) and the chairs—i.e. prof. K.T. Geurs (Karst), prof. J. Henseler (Jörg) and prof. G.R.B.E. Römer (Gert-willem)— of the three Examination Boards of programs hosted by the Faculty of ET, evaluated the function of the boards. It was concluded that the Examination Boards are “in control”.

## 3.2 Outlook to 2023-2024

In the next academic year (2023-2024), the Examination Board plans to address the following:

- Due to the increased number of cases handled by the (secretary of the) Examination Board ME/SET (see section, the Faculty Board has been asked to provide extra administrative support (registrar) to the secretary. The form and nature of this support will be discussed and implemented.
- Also as a result/outcome of the training by TAQT (see section 2.8) the Faculty Board ET, program director ME/SET, Faculty Council ET and the Examination Board ME/SET have all agreed to improve the efficiency of the procedure to establish Education and Examination Regulations (EERs) of the programs MSc& MSc ME and MSc SET, starting Feb/Mar 2023. Also the Program Committees (Dutch: OLC) of the ME and SET programs need to join this initiative. In parallel the Rules & Regulations of the Examination Board will be aligned with the updates of the EERs.
- Continue the evaluation of tests and test plans in Modules of the BSc program ME, as was initiated earlier. This process it too laborious for the MSc SET program given the relatively small number of lectures/examiners involved in that program. Therefore, a efficient, yet effective process of evaluation of tests and test plans will be developed in collaboration with the SET program management.
- Reflect on further improvements of the procedures to safeguard assessment in all programs.