

## Besluit

**Besluit strekkende tot het verlengen van de geldigheidsduur van het accreditatiebesluit van 11 mei 2011 zoals bedoeld in artikel 5a.12a van de Wet op het hoger onderwijs en wetenschappelijk onderzoek (WHW) van de opleiding wo-bachelor Technische Bedrijfskunde van de Technische Universiteit Eindhoven tot en met 30 oktober 2019**

	<b>Gegevens</b>	
<b>datum</b>	<b>Naam instelling</b>	: Technische Universiteit Eindhoven
31 oktober 2017	<b>Naam opleiding</b>	: wo-bachelor Technische Bedrijfskunde (180 EC)
<b>onderwerp</b>	<b>Datum aanvraag</b>	: 1 mei 2017
Besluit	<b>Variant opleiding</b>	: voltijd
tot het verlengen van de	<b>Locatie opleiding</b>	: Eindhoven
geldigheidsduur wo-bachelor	<b>Datum goedkeuren</b>	
Technische Bedrijfskunde van	panel	: 10 oktober 2016
de Technische Universiteit	<b>Datum locatiebezoeken</b>	: 18 en 19 januari en 20 februari 2017
Eindhoven	<b>Datum visitatierapport</b>	: 18 april 2017
(005699)	<b>Instellingstoets kwaliteitszorg</b>	: ja, positief besluit van 6 mei 2014
<b>uw kenmerk</b>		
CvB 2017/1649225		
<b>ons kenmerk</b>		
NVAO/20172802/ND	<b>Beoordelingskaders</b>	
<b>bijlagen</b>	– Beoordelingskader voor de beperkte opleidingsbeoordeling van de NVAO (Stcrt. 2014, nr 36791);	
2	– Artikel 5a.12a van de WHW (Stb. 2010, 293);	
	– Accreditatiebesluit WHW (Stb. 2011, 536).	

### **Advies van het visitatiepanel**

Samenvatting bevindingen en overwegingen van het panel.

'The bachelor's programme Technische bedrijfskunde (Industrial Engineering and Management Science in English; hereafter IE) is a full time programme offered by the Department of Industrial Engineering and Innovation Sciences (hereafter: Department IE&IS) at the Eindhoven University of Technology (hereafter: TU/e), consisting of 180 EC spread evenly over three years. It is taught in Dutch. Since September 2012, the undergraduate programs of the TU/e are organised in the TU/e Bachelor College (hereafter: TU/e BC). Within the TU/e BC, the School IE offers a major programme in Industrial Engineering. IE is part of the School of Industrial Engineering (hereafter: School IE) with the master's programmes Operations Management and Logistics (OML) and Innovation Management (IM).

Pagina 2 van 8 The bachelor's programme IE is directed towards the performance of business processes and strongly focusses on the role of the engineer within a company, which is rendered both appropriate and a positive feature by the panel. The programme is served by a clear description of its mission and objectives, which have also been clearly translated into well-formulated intended learning outcomes. The intended learning outcomes reflect the academic orientation of the programmes and enable students to meet the required level. These learning outcomes form a good basis for the formulation of the programme's curriculum and for assessment procedures and they meet international requirements.

The panel renders the programme's profile appropriate yet still comparable in scope to other programmes in IE in the Netherlands. The introduction of the TU/e BC, in this respect, has acted as a catalyst for change with the introduction of a defined TU/e graduates' profile; TU/e bachelor students are now defined by the diversity of choice offered within the TU/e BC structure, resulting in diverse and, in individual cases, unique profiles within the field of IE. With the TU/e BC now firmly established, further differentiation of IE's profile may be expected in the future. The assessment panel considers the broad range of courses and of majors available in the TU/e BC a positive development, allowing flexibility for students to shape their bachelor's studies towards their personal interests and to create a more unique take on the field. Nevertheless, it also emphasises the need for continuous guidance throughout the bachelor's programme, to closely supervise students' disciplinary profile, i.e. programme-specific core profile, to assure a recognisable IE profile.

The change to a full English programme, scheduled for the year 2018-2019, may fuel a further international profile of IE, setting it apart from similar programmes in the Netherlands. A learning outcome directed towards international cooperation, and/or experience within an international setting, might therefore be appropriate upon implementation of this suggested change in the panel's view. This would, again, result in further differentiation and feed into a unique profile for IE's programme. This could further the programme's international ambitions and create opportunities for the students to take parts of their studies abroad, or within an international setting, within the regular curriculum. In addition, the panel advises the programme to offer guidance, support and training to those lecturers who may need help in fortifying their English language skills before the proposed change to a full English programme.

In the panel's view, the bachelor's programme is tailored towards its aims and it offers students both scientific knowledge and experience with the behaviour and performance of business processes in industrial and service organisations. The quality of the programme is good. During their bachelor studies, students are offered an overview of relevant academic research in the disciplinary major courses, while also being exposed to ideas and insights from adjacent disciplines in the various packages offered by both the TU/e BC and the TU/e disciplines. The TU/e BC has resulted in a curriculum design intermingling strands of mandatory major courses, electives, elective packages and TU/e BC courses. It offers flexibility to pursue one's interest within the constraints of the TU/e BC, which is appreciated by the panel. The programme design offers flexibility to students, but only within the national context. The panel advises the programme to explore options for further internationalisation within the bachelor's programme with all stakeholders involved.

In addition, the panel recommends the programme to intensify its ties with its alumni and to strongly support alumni initiatives. Alumni could potentially be a good source for internships, job market orientation and for providing suitable projects and problems for students'

Pagina 3 van 8 Bachelor End Project (hereafter: BEP). Study progress and the amount of hours spent on their studies should be a cause of continuous vigilance by the programme.

According to the panel, small changes within the current programme design could be considered, in particular with respect to the preparation trajectory of the BEP. It recommends the introduction of one additional compulsory major course resembling 'Quick Scan Internship for IE', prolonging or redesigning the BEP, and/or other suitable measures to counter potential risks of subjectivity within the current supervision system and to guarantee all students an adequate preparation trajectory for their BEP. Although the professional skills are well-embedded within the programme and the TU/e BC, the integration needs continuous attention as the panel learned from discussions with students. Therefore, the panel advises the programme to continuously assess the integration of these skills into the major courses and the way in which all these courses are assessed, paying attention to individual skill development in order to counterbalance potential evasion behaviour and free-riding practices by students.

The panel has verified in meetings with the programme management and academic staff that both have a proactive and problem-solving attitude towards problems within the current programme. Staff and management regularly discuss the curriculum in formal and informal meetings with all relevant stakeholders. It considers the teaching staff equipped for its tasks and appreciates its proactive attitude regarding challenges posed by the new curriculum and programme design and the increased workload in response to the increase in students since 2012. The staff-to-student ratio is rather high and staff is currently pressed for research time. Although the management is aware and acts adequately with recent additions to its staff and the use of additional teaching assistants, the panel advises the programme to continue addressing this matter.

In its didactic approach, the bachelor's programme aims at a balanced combination of individual and group work. The panel verified that the programme uses a variety of activating teaching methods, such as interim tests and quizzes during lectures. Self-study is stimulated in several ways: in various courses students get homework assignments that count for grading; other courses make use of small intermediate tests. Application of knowledge is central in assignments, which are performed individually or in small groups. Multiple choice examinations for assessing students' progress are currently used to assess many of the programme's courses. The panel recommends reshaping some of these assessments, in particular for courses that are intended to develop students' professional and academic research skills. Overall, the teaching methods, lectures and tutorials are in line with the contents of the curricula and support the students to achieve the learning outcomes.

The panel established that the bachelor's programme IE has, as of September 2016, a satisfactory assessment system. Assessments are drafted with the involvement of two members of staff, and marked by two independent assessors. Students are involved in certain courses in additional peer review practices, which is appreciated by the panel. The BoE regularly convenes with management and informs both students and staff about assessment procedures and assures the quality of assessment throughout the programme. Students are well-informed about the criteria of assessment, assessment procedures and modes of assessment.

The panel's findings during the site visit neutralised their initial concerns regarding the quality assurance of assessment of the achieved learning outcomes, as converged in the

Pagina 4 van 8 BEP. With the introduction of a second examiner in September 2016, the panel verified that the BoE has various control mechanisms in place to safeguard the achieved level of bachelor theses. The introduction of a mandatory second examiner counterbalances subjectivity of assessments and could serve to further align the assessment. The panel has, however, not been able to ascertain the benefits of the second examiner as control mechanism, as the new assessment system for the BEP still needs to produce results.

The BoE's BSc thesis assessment committee is bound to perform stratified spot checks of the BEP. This is appreciated and deemed necessary by the panel to safeguard the quality of assessment. Adequate time allowances should be allocated to staff members performing this important task, as the panel feels that too many irregularities in the theses' assessments came to light during the site visit. The panel also recommends the thesis assessment committee to pay specific attention to theses around the pass/fail demarcation line and to the motivation by supervisors for passing these theses in order to assure the quality of assessment and the consistency of marking practices. Scoring criteria, and underlying compensation rules, were rendered subjective by the panel. In addition, the panel recommends the programme to further redesign its thesis assessment forms for qualitative feedback and additional transparency by the use of rubrics or another suitable measure.

The BoE at IE functions within the constraints of the law. It regularly convenes with management and informs both students and staff about assessment procedures and assures the quality of assessment throughout the programme. The panel noted that quality assurance with regards to the basic course 'Professional Skills' is adequately met. Therefore, the panel concluded that the BoE at IE is now in control and has various instruments in place to guarantee a fair assessment. The addition of a second examiner is considered a necessary measure to safeguard the quality of the BEP. This still needs to prove to be the case in the coming years and demand active monitoring. The BoE aims to develop test matrices for the different programmes in the school. It also considers developing rubrics for the BEP assessment form a priority in the near future. Both ambitions are warmly supported by the panel.

Although graduates of the programme feel confident and successfully proceed their studies and although several examples of adequately marked, well-presented research were encountered, the panel concluded that, for the period under consideration, too many inconsistencies and examples of subjective marking for the BEP have been established with respect to the achieved learning outcomes at IE. In the panel's assessment, more than 10% of the evaluated theses did not meet the intended learning outcomes. These results were partly confirmed by internal research at TU/e. The rejected theses did not achieve the intended learning outcomes in their presentation, academic depth, adequate use of literature and reflection upon a problem or research question.

The panel considers the BEP a suitable project to establish the achieved learning outcomes. The professional setting, the form as a research assignment directed towards solving an existing problem or answering a research question with the use of relevant academic literature and some qualitative or quantitative modelling meet the panel's full approval. Nevertheless, the panel wonders whether it is in its current scope too ambitious for the time assigned to the project. It advises the programme to rethink the preparation trajectory for the BEP. It also encourages the management to continuously align its staff regarding the importance of the BEP as the final project that encompasses all intended learning outcomes

Pagina 5 van 8 and to circulate clear scoring criteria and compensation rules amongst its examiners on a regular basis. Notwithstanding these considerations, the panel is confident that the programme will be able to address these concerns, aided by IEM's strong curriculum, attentive and well-qualified staff and satisfactory teaching-learning environment.'

### **Herstelplan**

De NVAO heeft de Technische Universiteit Eindhoven bij brief van 18 juli 2017 gemeld dat zij op grond van de negatief beoordeelde kwaliteit van de opleiding niet kan overgaan tot accreditatie van de opleiding, waar de instelling bij brief van 2 mei 2017 om had verzocht. Zij heeft de instelling in de gelegenheid gesteld om een herstelplan in te dienen waarin deze aangeeft welke verbetermaatregelen zij zal nemen om tegemoet te komen aan alle kritiekpunten en/of aanbevelingen van het panel met betrekking tot standaard 4 (Gerealiseerde eindkwalificaties). De NVAO heeft per brief van 11 september 2017 een door het panel beoordeeld herstelplan ontvangen.

In het herstelplan geeft de instelling eerst een overzicht van de kritiekpunten en aanbevelingen van het panel op het gebied van de aangetroffen inconsistenties bij het beoordelen van het BSc Eindproject (BEP) in relatie tot de specifieke leerdoelen. Vervolgens wordt een overzicht gegeven van te introduceren of te handhaven maatregelen alsook een tijdslijn voor het realiseren van het herstel.

### **Advies van het panel over het herstelplan**

In het herstelplan wordt een overzicht gegeven van maatregelen die naar het oordeel van het panel, bij juiste implementatie, het gewenste effect zullen bewerkstelligen op stroomlijning van de beoordelingsprocedure en het bereiken van het gewenste kwaliteitsniveau. Het pakket voorziet onder meer in nadere uitwerking en communicatie van het beoordelingsformat, inclusief regels voor weging en compensatie, onafhankelijke beoordeling door twee beoordelaars met voldoende ervaring, training van nieuwe beoordelaars en communicatie met reeds actieve beoordelaars, een actieve toezichthoudende rol van de Examencommissie en tenslotte een duidelijk communicatietraject richting studenten. Het herstelplan voorziet tevens in een realistische tijdslijn voor implementatie.

Het panel stelt vast dat het herstelplan zich sterk richt op de beoordeling van het Bachelor Eindproject (BEP). Het wijst de opleiding erop dat het ook suggesties heeft gegeven voor de toetsing van onderzoekscompetenties in het traject dat voorbereidt op het BEP. De opleiding zou deze competenties bijvoorbeeld niet alleen via groepsopdrachten en meerkeuzevragen kunnen toetsen.

Op grond van deze informatie acht het panel het opgestelde herstelplan een adequaat antwoord op zijn kritiekpunten en komt het tot een positief advies over het herstelplan. Als het herstelplan wordt uitgevoerd zoals nu omschreven en als de opleiding daarbij ook aandacht besteedt aan het op het BEP voorbereidende traject, ligt het in de ogen van het panel voor de hand dat de opleiding over ruim een jaar aan de eisen voor heraccreditatie voldoet.

### **Conclusie NVAO**

Op basis van het herstelplan en het positieve advies van het panel daarover besluit de NVAO tot toepassing van het bepaalde in artikel 5a.12a van de WHW (herstelperiode). Naar het oordeel van de NVAO is met het herstelplan en het positieve oordeel van het panel

Pagina 6 van 8 daarover voldoende aannemelijk gemaakt dat de opleiding binnen de termijn van twee jaar alsnog aan het kader zal voldoen.

De NVAO verzoekt om de aanbevelingen van het panel in de andere standaarden (die niet onvoldoende beoordeeld zijn) mee te nemen in het herstel.

#### **Besluit**

Ingevolge het bepaalde in artikel 5a.10, derde lid, van de WHW heeft de NVAO het college van bestuur van de Technische Universiteit Eindhoven te Eindhoven in de gelegenheid gesteld zijn zienswijze op het voornemen tot besluit van 25 september 2017 naar voren te brengen. Van deze gelegenheid heeft het college van bestuur geen gebruik gemaakt.

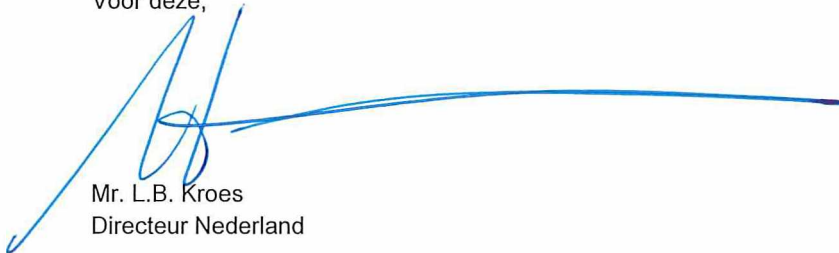
De NVAO besluit tot verlenging van de geldigheidsduur van het accreditatiebesluit van 11 mei 2011 van de opleiding wo-bachelor Technische Bedrijfskunde (180 EC; variant: voltijd; locatie: Eindhoven) van de Technische Universiteit Eindhoven te Eindhoven tot en met 30 oktober 2019.

Ingevolge het bepaalde in artikel 5a.12a, vierde lid, van de WHW dient het instellingsbestuur een aanvraag om een besluit tot vaststelling dat de opleiding alsnog aan het toepasselijke kader voldoet, uiterlijk in te dienen op 30 april 2019.

Den Haag, 31 oktober 2017

Namens het bestuur van de NVAO

Voor deze,



Mr. L.B. Kroes  
Directeur Nederland

Tegen dit besluit kan op grond van het bepaalde in de Algemene wet bestuursrecht door een belanghebbende bezwaar worden gemaakt bij de NVAO. De termijn voor het indienen van bezwaar bedraagt zes weken.

Onderwerp	Standaard	Beoordeling door het panel
<b>1. Beoogde eindkwalificaties</b>	De beoogde eindkwalificaties van de opleiding zijn wat betreft inhoud, niveau en oriëntatie geconcretiseerd en voldoen aan internationale eisen.	<b>Voldoende</b>
<b>2. Onderwijsleeromgeving</b>	Het programma, het personeel en de opleidingsspecifieke voorzieningen maken het voor de instromende studenten mogelijk de beoogde eindkwalificaties te realiseren.	<b>Voldoende</b>
<b>3. Toetsing</b>	De opleiding beschikt over een adequaat systeem van toetsing.	<b>Voldoende</b>
<b>4. Gerealiseerde eindkwalificaties</b>	De opleiding toont aan dat de beoogde eindkwalificaties worden gerealiseerd.	<b>Onvoldoende</b>
<b>Eindoordeel</b>		<b>Onvoldoende</b>

De standaarden krijgen het oordeel onvoldoende, voldoende, goed of excellent.

Het eindoordeel over de opleiding als geheel wordt op dezelfde schaal gegeven.

- Prof.dr.ir. R.E.C.M. (Rob) van der Heijden, is since June 2016 Professor in Innovative Planning Methods within the Nijmegen School of Management, Radboud University Nijmegen [chair];
- Prof.dr. H.M.C. (Harrie) Eijkelhof, was until his retirement in 2014 Director of the Freudenthal Institute for Science and Mathematics Education at the Faculty of Science at Utrecht University;
- Prof.dr. E. (Erik) Demeulemeester, is since 2001 Full Professor at the Faculty of Economics and Business and Head of the Research Center for Operations Management at the University of Leuven;
- Prof.dr. J. (Jan) Kratzer, is Chair of Entrepreneurship and Innovation Management and Managing Director of the Center for Entrepreneurship at Berlin Institute of Technology, Germany;
- S. (Sofie) Vreriks BSc, is in her second year of her master Industrial Engineering and Management at the University of Twente [student member].

Het panel werd ondersteund door dr. E. (Els) Schröder, secretaris (gecertificeerd).