

Besluit

Besluit strekkende tot het verlenen van accreditatie aan de opleiding wo-bachelor Werktuigbouwkunde van de Technische Universiteit Eindhoven

Gegevens

datum	Naam instelling	: Technische Universiteit Eindhoven
28 maart 2013	Naam opleiding	: wo-bachelor Werktuigbouwkunde (180 ECTS)
onderwerp	Datum aanvraag	: 18 december 2012
Definitief besluit	Variant opleiding	: voltijd
accreditatie wo-bachelor	Locatie opleiding	: Eindhoven
Werktuigbouwkunde van de	Datum goedkeuren	
Technische Universiteit	panel	: 10 juli 2012
Eindhoven	Datum locatiebezoek	: 25 september 2012
(001220)	Datum visitatierapport	: 23 november 2012
uw kenmerk	Instellingstoets kwaliteitszorg	: aangemeld en geaccepteerd voor het invoeringsregime
CvB2012/1425193		(art.18.32b en c van WHW)
ons kenmerk		
NVAO/20130951/ND		
bijlagen		

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Beoordelingskader

Beoordelingskader voor de beperkte opleidingsbeoordeling van de NVAO (Stcrt. 2010, nr 21523).

Bevindingen

De NVAO stelt vast dat in het visitatierapport deugdelijk en kenbaar is gemotiveerd op welke gronden het panel de kwaliteit van de opleiding voldoende heeft bevonden.

Advies van het visitatiepanel

Samenvatting bevindingen en overwegingen panel.

Bachelor programme Mechanical Engineering

This report presents the findings and considerations of the Werktuigbouwkunde 3TU committee on the bachelor's programme Mechanical Engineering at Eindhoven University of Technology. The committee bases its assessment on information from the self-evaluation report, additional information obtained from the discussions during the visit, the selected theses, and the documentation that was available for inspection during the site visit. For this programme, the committee has identified positive aspects as well as ones that could be improved. After considering them, the committee reached the conclusion that the programme meets the requirements for basic quality that form the condition for re-accreditation.

Inlichtingen

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Pagina 2 van 7 *Standard 1: Intended learning outcomes*

The intended learning outcomes of the bachelor programmes are based on the internationally accepted ABET standards. In addition, the 3TU have added criteria to this domain-specific frame of reference to emphasis future developments in science and society.

The final qualifications require that bachelor graduates have a disciplinary foundation in science, engineering and technology, are aware of the importance of other disciplines and of the temporal and social context, are able to investigate and design under supervision, have learned a scientific approach and have developed intellectual and communicative skills.

The learning objectives have been formulated in terms of academic competences, an outcome of the Academic Competences and Quality Assurance (ACQA) project. In an annex to the self-evaluation report the programme has provided an overview of the intended learning outcomes, the ACQA-competences and the Dublin descriptors. This shows that the final qualifications for the bachelor programme are in line with the international standards as described in the Dublin descriptors.

The committee concludes that the bachelor programme in Mechanical Engineering is clearly designed as an academic programme. It provides a solid disciplinary foundation and has a strong focus on research and on developing a scientific and critical attitude.

Standard 2: Teaching and learning environment

The new bachelor programme, starting 2012-2013, consists of basic courses in mathematics, physics, design, modelling and USE (User, Society and Enterprise), disciplinary courses in mechanical engineering and Design Based Learning (DBL) projects. In the projects students learn in groups of 8-10 students to apply the theoretical concepts to practical engineering problems and, also, to develop social and professional skills. In the second and third year students can select a number of elective courses. The bachelor final project (BFP) is a substantive individual project. Students have to show initiative and analytical skills and must present their results in a written report and an oral presentation. The report must meet academic standards.

The curriculum described above is a re-designed and modular programme. In 2012-2013 the second and third year of the bachelor programme are of the 'old' programme. They have a different set-up (more but smaller courses and fewer elective courses) but the main mechanical engineering content and approach are the same. The bachelor curriculum is coherent and has a good scientific profile. It presents the students with an increasing degree of complexity.

The bachelor programme has an appropriate mix of lectures, guided self-study, group work in the DBL projects and individual work in courses (exam preparation) and the BFP. Students are positive about the learning outcomes of the DBL projects. The projects provide a good link between theory and practice and students acquire academic and professional skills.

The committee finds the feasibility of the programme to be realistic even though very few students finish in the nominal time. The structure of the programme allows students who want to obtain their degree within the allotted time to do so. Students are required to at least obtain 30 EC in the first year before they are allowed to continue (Binding Study Advice,

Pagina 3 van 7 BSA). The committee understands that the 30 EC limit has been established by the Board of the University, but finds this limit not very ambitious. Per September 2012 the university has introduced the 'harde knip', the requirement to have finished the bachelor programme before starting the master programme. The department has developed a good set of regulations to do justice to the 'harde knip' without creating a long study delay for students who are only a few credits short.

The teaching staff of Mechanical Engineering is well-qualified and committed. More staff members should be stimulated to acquire the University Teaching Qualification, for instance by organising meetings based on best practices and an exchange of experiences. Contacts between lecturers and students are frequent and informal. Students express their appreciation of this. The teaching load is high, especially because of the process of re-design of the bachelor programme. The student interest is not evenly distributed over the research groups and professors. Students, therefore, cannot always do the BFP of their first choice. For the bachelor programme the committee finds this acceptable.

The department has ample facilities in a newly renovated building. The study guidance and counselling are very well organised and students appreciate the proactive approach of the student counsellors.

The quality assurance system is firmly embedded in a PDCA-cycle. All courses are regularly evaluated by student questionnaires and the results are discussed by the quality control officer with the lecturers and the Education Committee. The committee advises to investigate how the response rates can be increased because they are often quite low. The department has followed up on the recommendations of the previous assessment committee.

Standard 3: Assessment and achieved learning outcomes

Bachelor courses are assessed by written exams. Exams are cross-checked and verified by colleague lecturers prior to the exam date. The assessment of the DBL projects is a combination of an assessment of the group report and of the individual contribution to the group work. After a training in peer review students assess each other. They express their satisfaction with this procedure. The BFP is assessed on the basis of an academic report and a presentation.

The committee recommends that for each course and each project clear descriptions of the learning objectives are provided, including a test matrix. This will guarantee the transparency, validity and reliability of the assessments. The committee also advises the Board of Examiners to check the implementation of the assessment procedures, especially of the BFP.

The committee examined a representative sample of bachelor theses and generally found the marking to be fair and consistent. On the basis of the theses, the committee concludes that graduates achieve an academic bachelor's level.

This conclusion is confirmed by the experiences recounted by the alumni. Graduates find relevant jobs at an appropriate level within a fairly short time, and they are satisfied with the broad knowledge basis and engineering skills they learned in the programme. They would have wished more systematic attention to soft skills and professional skills. The new bachelor programme is expected to address this aspect.

De NVAO onderschrijft de volgende aanbevelingen van het panel:

- a) Op een creatieve en efficiënte wijze werken aan het versterken van de didactische kwalificaties van de docenten
- b) Ontwikkelen van toetsbeleid om transparante, valide en betrouwbare toetsen te waarborgen.

Besluit

Ingevolge het bepaalde in artikel 5a.10, tweede 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 26 februari 2013 naar voren te brengen. Bij e-mail van 27 maart 2013 heeft de instelling gereageerd op het voornemen tot besluit. Dit heeft geleid tot aanvulling van bijlage 2 in het definitieve besluit.

Op grond van het voorgaande besluit de NVAO accreditatie te verlenen aan de wo-bachelor Werktuigbouwkunde (180 ECTS; variant: voltijd; locatie: Eindhoven) van de Technische Universiteit Eindhoven te Eindhoven. De NVAO beoordeelt de kwaliteit van de opleiding als voldoende

Dit besluit treedt in werking op 1 januari 2014 en is van kracht tot en met 31 december 2016 (2019)¹.

Den Haag, 28 maart 2013

Nederlands-Vlaamse Accreditatieorganisatie

b/a 

Lucien Bollaert
(bestuurder)

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.

¹ Gelet op het bepaalde in artikel 18.32c, derde lid, van de Wet op het hoger onderwijs en wetenschappelijk onderzoek (WHW) bedraagt de geldigheidsduur van de accreditatietermijn van de opleiding maximaal drie jaar zolang de instelling nog niet beschikt over een positieve instellingstoets kwaliteitszorg. Zodra de instellingstoets is verkregen, wordt de accreditatietermijn verlengd naar zes jaar.

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

De standaarden krijgen het oordeel onvoldoende (O), voldoende (V), goed (G) of excellent (E). Het eindoordeel over de opleiding als geheel wordt op dezelfde schaal gegeven.

Tabel 1: uitval na 1, 2 en 3 jaar

Cohort	2006	2007	2008	2009	2010	2011
Uitval na 1 jr	27%	24%	16%	32%	28%	
Uitval na 2 jr	26%	29%	27%	37%		
Uitval na 3 jr	39%	31%	30%			

Tabel 2: Rendement (VWO-instroom)

Cohort	05/06	06/07	07/08	08/09
Rendement na 3 jaar	17%	11%	13%	11%
Rendement na 4 jaar	34%	30%	45%	
Rendement na 5 jaar	55%	51%		
Rendement na 6 jaar	69%			

Tabel 3: Rendement (totale instroom)

Cohort	05/06	06/07	07/08	08/09
Rendement na 3 jaar	15%	11%	11%	10%
Rendement na 4 jaar	31%	28%	40%	
Rendement na 5 jaar	50%	47%		
Rendement na 6 jaar	62%			

Tabel 4: Docentkwaliteit

Graad	MA	PhD	BKO
Percentage	- %	100%	19%

Tabel 5: Student-docentratio

Ratio	17,2
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Tabel 6: Contacturen

Studiejaar	1	2	3
Contacturen	591	522	348

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- Prof. dr. J.K.M. De Schutter, professor of Mechanical Engineering, KU Leuven;
- Prof.dr. J.J. ter Meulen; emeritus professor Applied Physics, Radboud University Nijmegen;
- Ir. G.Calis, former Corporate Head Office Stork B.V.;
- Ir.H.Grunefeld, educational development consultant, Utrecht University
- T.O.W. Opraus, bachelor student of Mechanical Engineering, Delft University of Technology.

Het panel werd ondersteund door dr. M.J.H. van der Weiden, secretaris (gecertificeerd).