

## Besluit

### Besluit strekkende tot het verlenen van accreditatie aan de opleiding wo-bachelor Werktuigbouwkunde van de Universiteit Twente

#### Gegevens

<b>datum</b>	Naam instelling	: Universiteit Twente
25 maart 2013	Naam opleiding	: wo-bachelor Werktuigbouwkunde (180 ECTS)
<b>onderwerp</b>	Datum aanvraag	: 21 december 2012
Definitief besluit	Variant opleiding	: voltijd
accreditatie wo-bachelor	Locatie opleiding	: Enschede
Werktuigbouwkunde van de	Datum goedkeuren	
Universiteit Twente	panel	: 10 juli 2012
(001305)	Datum locatiebezoeken	: 14 september 2012
<b>uw kenmerk</b>	Datum visitatierapport	: 29 november 2012
S&B/399.280/JB	Instellingstoets kwaliteitszorg	: aangemeld en geaccepteerd voor het invoeringsregime van
<b>ons kenmerk</b>		de instellingstoets kwaliteitszorg als bedoeld in
NVAO/20130850/ND		artikel 18.32 b en c van de WHW
<b>bijlagen</b>		
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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.

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 the University of Twente. 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.

*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 emphasise future developments in science and society.

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 a 3TU project. In an annex to the self-evaluation report the programme has provided an overview of the intended learning outcomes, the academic competences and how the individual curriculum elements contribute to them. 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-learning environment*

Characteristic for the bachelor programme is Project Led Education (PLE). In parallel to the courses, students work in groups of eight students on project assignments. The PLE philosophy requires that students are not just presented with knowledge in courses but discover it for themselves in the project assignment. In this way they learn more about the integration and coherence of the theories they have been taught in the courses. They also develop a much higher degree of independence and initiative, which in the eyes of the staff members is clearly visible in the way students handle the graduation assignments. Alumni also mention PLE as the most useful of their education. The final project of the bachelor programme is a group project (project F), in which 75% of the assessment is based on the student's individual performance.

The learning objectives of the bachelor programme are translated well into the courses, PLE projects and a minor. The Course Information and Assessment Plans are useful documents for students, staff and individual lecturers. The academic education takes place mainly in the PLE projects and is focused on personal and social skills.

Pagina 3 van 7 Social issues such as sustainability are addressed in project C, but, generally speaking, do not seem to play a prominent role in the bachelor programme. Research skills and academic writing are taught in project ITO, the last project in the bachelor programme. The committee is of the opinion that this is rather late and recommends that more structural attention is paid to formal academic skills earlier in the programme. The committee advises to also pay more attention to social issues and the role of the mechanical engineer.

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. Compared to similar programmes in the Netherlands the bachelor output is relatively good. Measures taken to reduce the average length of study are the mentor system, 'harde knip', a modular structure per 2013-2014 and summer courses. The committee supports the department's policy to achieve a better and faster selection in the first year. In addition, a culture change is needed: for students on the one hand to invest more time in their studies from the very beginning and on the other hand to be aware that 'good' is 'good enough' and that meeting deadlines is a fact of life in a professional career too.

The teaching staff of Mechanical Engineering is well qualified and committed, with strong links to industry. They are good teachers, as pointed out by the course evaluations. The staff/student ratio is 1:25 and the teaching load is on average 40%, which the committee considers reasonable.

The department has very good facilities in laboratories, lecture halls and project rooms and they are used intensively. The study guidance and counselling are very well organised and the PLE tutors and mentors play an active role.

The quality assurance system works well. All courses are regularly evaluated by student questionnaires and the results, including the lecturer's response, are published and discussed by the Educational Committee. The department has followed up on the recommendations of the previous assessment committee.

*Standard 3: Assessment and achieved learning outcomes*

The assessment policy is very explicit and the assessment system is very well implemented. Test plans are available for courses and projects, response formats are worked out in detail and guide the evaluation of all types of assessments, including oral exams and re-sits. Exams are cross-checked and verified by colleague lecturers prior to the exam date. Elaborate feedback is provided to students. The Board of Examiners is clearly in control.

The committee examined a representative sample of bachelor theses and 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 who are satisfied with the basic knowledge and engineering skills they learned in the programme, but especially with the mind-set and approach they learned from PLE.

De NVAO onderschrijft de aanbeveling van het panel om eerder in de bachelor aandacht te besteden aan academische vaardigheden en onderstreept dat de gerealiseerde studieduur systematisch langer is dan de nominale studieduur.

**Besluit**

Ingevolge het bepaalde in artikel 5a.10, tweede lid, van de WHW heeft de NVAO het college van bestuur van de Universiteit Twente te Enschede in de gelegenheid gesteld zijn zienswijze op het voornemen tot besluit van 26 februari 2013 naar voren te brengen. Bij e-mail van 4 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: Enschede) van de Universiteit Twente te Enschede. 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)<sup>1</sup>.

Den Haag, 25 maart 2013

Nederlands-Vlaamse Accreditatieorganisatie



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.

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<sup>1</sup> Gelet op het bepaalde in artikel 18.32c, derde lid, van de Wet op het hoger onderwijs en wetenschappelijk onderzoek (Wet) 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.

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

**Table 9: Cumulative percentage of dropouts in the Bachelor's programme**

	<b>% after 1 year</b>	<b>% after 2 years</b>	<b>% after 3 years</b>
2005-2006	21.9%	38.8%	43.9%
2006-2007	9.1%	12.8%	16.0%
2007-2008	10.6%	18.9%	21.2%
2008-2009	12.0%	19.1%	20.2%
2009-2010	14.5%	22.8%	
2010-2011	24.0%		
<b>Average</b>	<b>14.7%</b>	<b>21.0%</b>	<b>23.2%</b>

**Tabel 2: Rendement**

**Table 7: Bachelor's efficiency (re-enrolment); degree obtained after 3, 4, 5 and 6 years (cumulative in %)**

<b>Performance of Bachelor's students</b>					
<b>Cohort</b>	<b>Number</b>	<b>% after 3 years</b>	<b>% after 4 years</b>	<b>% after 5 years</b>	<b>% after 6 years</b>
2005-2006	64	14%	45%	64%	72%
2006-2007	120	17%	38%	65%	
2007-2008	101	14%	37%		
2008-2009	102	16%			
2009-2010	101				
2010-2011	78				

**Tabel 3: Docentkwaliteit.**

<b>Graad</b>	<b>MA</b>	<b>PhD</b>	<b>BKO</b>
<b>Percentage</b>	37%	53%	30%

**Tabel 4: Student-docentratio.**

<b>Ratio</b>	25:1
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**Tabel 5: Contacturen.**

	<b>First year Bachelor's</b>	<b>Second year Bachelor's</b>	<b>Third year Bachelor's</b>
Lectures	255 hours	355 hours	215 hours
Seminars	200 hours	195 hours	25 hours
Practicals	85 hours	40 hours	35 hours
Minors (20 EC)			280 hours
<b>Total</b>	<b>540 hours</b>	<b>590 hours</b>	<b>555 hours</b>

Pagina 7 van 7 **Bijlage 3: panelsamenstelling**

- 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;
- Prof. dr. M. Vantorre, professor of Maritime Technology, Ghent University;
- Ir. G.Calis, former Corporate Head Office Stork B.V.;
- S.E.M. Janssen BSc, master student of Mechanical Engineering, Eindhoven University of Technology.

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