

Besluit

Besluit strekkende tot het verlenen van accreditatie aan de opleiding wo-bachelor Technische Natuurkunde van de Universiteit Twente

	Gegevens	
datum	Naam instelling	: Universiteit Twente
31 december 2014	Naam opleiding	: wo-bachelor Technische Natuurkunde (180 ECTS)
onderwerp	Datum aanvraag	: 10 juli 2014
Besluit	Variant opleiding	: voltijd
accreditatie wo-bachelor	Locatie opleiding	: Enschede
Technische Natuurkunde	Datum goedkeuren	
Universiteit Twente	panel	: 10 februari 2014
(003185)	Datum locatiebezoeken	: 18 en 19 maart 2014
uw kenmerk	Datum visitatierapport	: 11 juni 2014
CvB UIT - 440/S&B	Instellingstoets kwaliteitszorg	: ja, positief besluit van 2 mei 2014
ons kenmerk		
NVAO/20144139/ND		
bijlagen		
3	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 van het panel (hierna ook: the assessment committee).

Standard 1 – Intended learning outcomes

The bachelor's degree programme Technische Natuurkunde is a Dutch taught, full-time programme and one of five bachelor's programmes in the Faculty of Science and Technology of the University of Twente. Its main goal is to provide students with a broad, basic knowledge of physics, mainly to prepare them to successfully enter a master's programme. There are no separate tracks, but students do choose from one of three areas of research for their bachelor's research project: optics, material physics or fluid physics. These research areas form the three specialization tracks within the master's programme Applied Physics of the University of Twente.

Inlichtingen

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Pagina 2 van 8 The assessment committee concludes that the bachelor's programme has a clear profile with attention for design. Prospective students know what to expect after having read the programme's mission and main goals. The committee also observes that the learning outcomes of the programme are carefully formulated. The programme identifies which specific research, designing and communication skills BSc graduates should possess. The intended learning outcomes of the bachelor's programme are broadly defined and geared towards enrolling in a master's programme. The committee concludes that the intended learning outcomes match the domain specific requirements and that the academic orientation of the bachelor's programme is in line with what can be expected from a scientific bachelor's programme from an international perspective. However, it also urges the programme management to reflect on whether all learning outcomes are realistic and match the programme in its current form.

Standard 2 Teaching-learning environment

The bachelor's programme Technische Natuurkunde consists of 180 EC, evenly divided over three years. Each year is further divided into four parts ('kwartielen') of approximately ten weeks each. The curriculum of the bachelor's programme consists of three parts: mandatory theoretical and experimental courses (130 EC), optional and orientation courses within or outside the discipline (15 EC and a 20 EC minor) and a bachelor assignment at the end of the third year (15 EC).

The committee concludes that the contents and design of the bachelor's programme ensure that students are able to obtain the intended learning outcomes. The programme has a clear structure, with limited room for optional courses. The programme's learning outcomes are well translated in the curriculum. The first year focuses on providing students with the necessary theoretical knowledge and experimental skills. The other two years of the bachelor's programme emphasize the application of knowledge, the development of learning skills and the ability to judge and reflect upon research – necessary requirements for working independently as a researcher. Students finish the programme with the bachelor research project, in which all of the intended learning outcomes are tested.

Starting in 2013/2014, the curriculum of the bachelor's programme has been redesigned as a result of the university-wide implementation of the Twents Onderwijs Model (TOM). First of all, the committee notes that the implementation of TOM in the applied physics programme appears to be the result of thorough discussions and planning. TOM offers new possibilities to further structure the programme and to improve study rates. The thematic modules seem carefully planned in a manner that ensures a more transparent connection between individual courses and between the courses and the overall aim of the programme. Less attention seems to be paid to the didactic concept underpinning the programme: the use of problem and project-based learning as the most important teaching method. The didactic concept, the committee finds, is not very transparent and requires further elaboration.

The committee is of the opinion that the scientific orientation of the programme is more than sufficiently safeguarded. It also concludes that the programme depends heavily on the study association Arago for job orientation outside research. The committee strongly suggests that the programme management secures a more prominent place for job orientation activities within the bachelor's programme.

Completion rates of the bachelor's programme are low, mainly because of a delay during the third year.

Pagina 3 van 8 The committee urges the programme management to implement appropriate solutions to reduce this delay. The committee concludes that the programme has an adequate system of study guidance in place. Students are enthusiastic about their lecturers and generally feel well supported in getting acquainted with studying, study orientation and study planning.

The committee concludes that the academic staff is more than very well equipped for delivering the programme. All lecturers participate in research and thus are able to teach students about the latest developments in their field. The committee was also impressed by the dedication and enthusiasm of which the teaching staff testified. TOM seems to have created a sense of team spirit that is beneficial for the programme as a whole. However, the committee also concludes that the implementation of TOM has made great demands on the lecturers. The committee concludes that the university and faculty have not anticipated this and should have provided the necessary support to cope with this extra workload. The high workload has also resulted in the fact that a significant percentage of staff has not yet obtained a basic teaching qualification (BKO).

The new teaching and laboratory facilities, the committee concludes, are impressive. The committee understands the importance of the physics labs for the bachelor's programme, and shares the opinion of the programme management and the dean of the faculty that all must be done to maintain the high standard of these laboratory facilities. The committee also finds it very important that the implementation of TOM is supported with the necessary facilities: administrative support for the lecturers and adequate teaching facilities for problem- and project-based learning.

The committee concludes that students are generally well involved in the evaluation of the programme. The assessment committee also concludes that the Programme Committee, which can play an important role in the process of quality assurance, could have been better informed about the implementation of TOM. The committee stresses the importance of a well-informed, pro-active Programme Committee. This Committee can help identify problems before they occur (not only at a course level, but also at the level of the programme as a whole) and to solve these problems. To conclude, the committee stresses the importance of evaluating not just individual courses, but the bachelor's programme as a whole. For this and other purposes, it would be desirable if the programme kept closer ties with its graduates.

Standard 3 Assessment and achieved learning outcomes

The committee finds the assessment procedure adequate. Students are well informed about assessment procedures. Assessment forms match the intended learning outcomes of the individual courses and of the programme as a whole. The committee considered exams in the bachelor's programmes to be of a high standard. It was also happy to see that for each exam there are test matrices available containing, for instance, model answers.

The Board of Examiners is responsible for drawing up and enforcing the rules and regulations, and for checking the quality of assessment within the programme. The committee concludes that the Board of Examiners fulfils its statutory tasks, but could adopt a more pro- active role. The Board should for example formulate an opinion on the assessment of group work in the bachelor's programme. Also, the Board should decide on its line of approach in matters such as detecting fraud and plagiarism.

Pagina 4 van 8 The introduction of a new assessment form for the bachelor's research project in September 2013 has led to more clarity on the criteria defining the final grade. Now the programme management and the Board of Examiners should stress the importance of properly filling in the forms.

To assess the level achieved by the students, the committee examined a range of bachelor theses. In general, it agrees with the marks that have been given and concludes that the level of the theses matches and surpasses the level that can be expected of a graduate of an academic bachelor's programme in applied physics.

Aanbevelingen

De NVAO onderstreept de aanbevelingen van het panel en vraagt in het bijzonder aandacht voor die met betrekking tot het verwerven van generieke competenties waarmee studenten zich ook kwalificeren voor andere vervolgopleidingen dan een doorstroommaster aan dezelfde instelling of voor een veelheid aan posities op de arbeidsmarkt.

Besluit

Ingevolge het bepaalde in artikel 5a.10, derde 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 3 november 2014 naar voren te brengen. Van deze gelegenheid is geen gebruik gemaakt.

De NVAO besluit accreditatie te verlenen aan de wo-bachelor Technische Natuurkunde (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 31 december 2014 en is van kracht tot en met 30 december 2020.

Den Haag, 31 december 2014

De NVAO
Voor deze:



Ann Demeulemeester
(vicevoorzitter)

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
1. Beoogde eindkwalificaties	De beoogde eindkwalificaties van de opleiding zijn wat betreft inhoud, niveau en oriëntatie geconcretiseerd en voldoen aan internationale eisen	Voldoende
2. Onderwijsleeromgeving	Het programma, het personeel en de opleidingsspecifieke voorzieningen maken het voor de instromende studenten mogelijk de beoogde eindkwalificaties te realiseren	Voldoende
3. Toetsing en gerealiseerde eindkwalificaties	De opleiding beschikt over een adequaat systeem van toetsing en toont aan dat de beoogde eindkwalificaties worden gerealiseerd	Voldoende
Eindoordeel		Voldoende

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

Data on intake, transfers and graduates

1 *Bachelor's programme Technische Natuurkunde:*

Intake:

	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Total intake per October 1	57	54	40	51	43	58	57	70	54
Female	5	8	5	7	3	6	11	9	7
	9%	15%	13%	14%	7%	10%	19%	13%	13%
German	-	1	2	-	2	1	1	1	1
Double programme	2	2	-	3	-	2	2	2	2
From other WO	4	2	1	1	1	3	1	5	3
From HBO	-	-	-	3	1	-	1	-	1
Criterion group⁽¹⁾	67%	67%	84%	80%	79%	75%	74%	85%	76%

(1) Criterion group is defined as students with an average VWO-grade for mathematics and physics of 7.0 or higher.

Cumulative dropout:

Cumulative dropout	2006	2007	2008	2009	2010	2011	2012	Cumulative dropout 2006-2012
after 1 year	40%	26%	13%	31%	30%	26%	39%	30%
after 2 years	46%	31%	20%	31%	30%	28%		32%
after 3 years	49%	37%	20%	33%	33%			36%
until now	53%	43%	28%	33%				39%
with P-diploma	2%	4%	0%	0%	0%			1%

Success rates:

Performances	all students	criterion group
P diploma \leq 1 year	28%	37%
P diploma \leq 2 years	48%	61%
P diploma final	60%	70%
BSc diploma \leq 3 years of re-registrants	17%	19%
BSc diploma \leq 4 years of re-registrants	47%	51%
BSc diploma \leq 5 years of re-registrants	63%	69%
BSc diploma final of re-registrants	83%	88%

Percentages are averages over the period 2001-2010.

Bachelor's programme Technische Natuurkunde:

Year	Scheduled hours								Minor	Bachelor Assignment	Contact hours (2)	Total number of hours
	Lectures	Tutorials	Combined Lect. & Tutor.	Lab courses	Projects	Supervised self-study	Exams (1)					
B1	175	200	25	150	30	50	50	*	*	680	1680	
	total: 400 (24%)			(9%)	(2%)	(3%)	(3%)			(40%)		
B2	195	240	60	170	35	-	40	*	*	740	1680	
	total: 495 (29%)			(10%)	(2%)		(2%)			(44%)		
B3	155	100	35	120	30	-	30	420	560	470	1680	
	total: 290 (17%)			(7%)	(2%)		(2%)			(28%)		

- (1) Excluding scheduled hours of re-exam
 (2) Excluding minor and bachelor assignment in B3

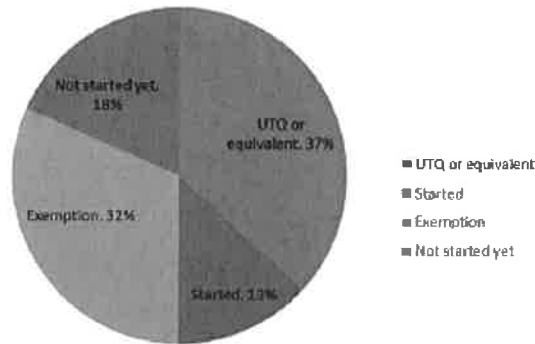
The programme calculates the average amount of face-to-face instruction of the programme as a whole at 18 hours per week.

Qualifications of the teaching staff:

Percentage of PhD:

Category	Total		% PhD	Female	
	No.	FTE		No.	FTE
Full professor	15	6,0	100%	2	0,8 (13%)
Professor (UHD+)	3	1,2	100%	1	0,4 (33%)
Associate professor (UHD)	12	4,8	100%	0	0 (0%)
Assistant professor (UD)	10	4,0	100%	3	1,2 (30%)
Other	3	1,2	33%	0	0 (0%)
Total	43	17,2		6	2,4 (14%)
Student assistants	24	1,3			

Percentage of basic teaching qualification:



UTQ or equivalent: Lecturers who have obtained their UTQ (University Teaching Qualification) or DUIT (Didactisch Universitair Inwerktraject Twente, precursor of UTQ)

Exemption: Lecturers with an appointment of more than 20 years at the University of Twente, or professors with an appointment of less than 8 hours a week ('deeltijdhoogleraren') are not obligated to enter the UTQ training

Started: Lecturers who have started with their UTQ training

Not started yet: Lecturers who have not started their UTQ training yet

Pagina 8 van 8 **Bijlage 3: panelsamenstelling**

- Prof. dr. Daan Lenstra (chair), professor emeritus of Electrical Engineering at Delft University of Technology and fellow at Eindhoven University of Technology;
- Prof. dr. Wim de Boer (member), professor of Physics at the University of Karlsruhe (DE);
- Prof. dr. Friso van der Veen (member), professor of Experimental Physics at ETH Zürich
- Christianne Vink MSc (member), didactic coach, educational advisor/trainer and partner of Academic Factory;
- Dr. ir. Harald Tepper (member), chief strategy officer at the Dutch Forensic Institute;
- Lisanne Coenen BSc (student member), master student Applied Physics at Delft University of Technology.

Het panel werd ondersteund door dr. J. Corporaal, secretaris (niet gecertificeerd, onder supervisie van gecertificeerd secretaris K.J. van Klaveren).