nvao
nederlands - vlaamse accreditatieorganisatie

Besluit

Besluit strekkende tot het verlenen van accreditatie aan de opleiding wo-master Nanotechnology van de Universiteit Twente

datum
31 december 2014
onderwerp
Definitief besluit accreditatie wo-master Nanotechnology Universiteit Twente (003184)
uw kenmerk
CvB UIT - 441/S&B
ons kenmerk
NVAO/20144139/ND
bijlagen
3

Gegevens

Naam instelling	:	Universiteit Twente
Naam opleiding	:	wo-master Nanotechnology (120 ECTS)
Datum aanvraag	:	10 juli 2014
Variant opleiding	:	voltijd
Locatie opleiding	:	Enschede
Datum goedkeuren panel	:	10 februari 2014
Datum locatiebezoeken	:	18 en 19 maart 2014
Datum visitatierapport	:	5 juni 2014
Instellingstoets kwaliteitszorg	:	ja, positief besluit van 2 mei 2014

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 committee).

Standard 1 Intended learning outcomes

The master's degree programme Nanotechnology is situated in the Faculty of Science & Technology. It is one of 36 master's programmes offered by the University of Twente. The programme has formulated its mission statement as: 'to educate students at an internationally renowned master's level to become proactive researchers, designers and engineers who are capable of developing, conveying and applying innovative knowledge according to academic standards in nanotechnology'. The programme does not have separate tracks.

The programme is aimed at (international) students with a background in advanced technology, applied physics, chemical engineering, electrical engineering, or other relevant

Inlichtingen
Fred Mulder
+31 (0)70 312 23 54
f.mulder@nvao.net

disciplines. It has a strong research-focus and is closely connected to two research institutes of the University of Twente: MESA+ Institute for Nanotechnology and MIRA Institute for Biomedical Technology and Technical Medicine.

The committee has discussed the profile, level and orientation of the programme. It sees a well-structured, truly multidisciplinary master's programme with much attention for individual students' progress.

The committee has studied the intended learning outcomes. It concludes that they are in line with the domain specific framework of reference and with the ACQA-criteria formulated by the three Dutch technical universities (3TU). The learning outcomes are in line with what may be expected from an academic master's programme from an international perspective. The outcomes distinctly surpass the level of a bachelor's programme.

Standard 2 Teaching – learning environment
The master's degree programme Nanotechnology consists of 120 EC, evenly divided over two years. Each year is further divided in four blocks of approximately ten weeks each, allowing students to follow at most two theoretical courses next to each other. The first year of the master's programme focuses on acquiring the necessary knowledge basis and laboratory skills, the second year is devoted completely to research.

The committee has studied the programme and the course descriptions. It concludes that the content and design of the master's programme Nanotechnology ensure that students are able to achieve the intended learning outcomes. The programme succeeds in offering a varied and challenging set of courses, reflecting the focus areas of research institutes MESA+ and (to a lesser extent) MIRA. The committee is aware of the fact that the range and the level of the courses are very much determined by the research groups that participate in the programme. The presence of internationally renowned research groups ensures that students are able to benefit from excellent research expertise. In this respect, the committee is also enthusiastic about the fact that students can participate in activities organized by MESA+, such as the Workshop Fundamentals of Nanotechnology, the MESA+ colloquia and the Annual Meeting.

The committee concludes that the scientific orientation of the programme is more than sufficiently safeguarded by the direct links with the two research institutes. The research-focus of the programme is clearly reflected in the curriculum. The students seem to appreciate this research-focus. The student representatives with whom the committee spoke, were all hoping to continue their education in a PhD-trajectory.

The committee strongly advises the programme management to pay more attention to professional orientation outside research. Especially given its technological profile, the programme should pay more attention to the full breadth of career opportunities in industry. The programme management is planning to set up a committee covering the professional field with alumni from the programme. The committee urges the programme management to carry out this plan at short notice.

The committee concludes that students highly appreciate the flexibility the programme gives them. This flexibility makes it possible to pursue personal interests while crossing boundaries between disciplines. Students eventually specialize in one subfield of

nanotechnology. There is a clear connection between the aims of the courses and the learning aims of the programme.
In a programme such as nanotechnology, the committee considers ethics an important subject in general. In this respect, the committee is enthusiastic about the course 'Societal embedding of Nanotechnology', which among others deals with the ethical implications of research in the area of nanotechnology.

The didactic concept of the programme, the committee finds, is not very transparent at the moment and asks for a better elaboration. The programme presently is discussing which aspects they would possibly like to adopt from the new Twents Onderwijs Model (TOM), introduced in all bachelor's programmes. The committee advises the programme to first get a clear picture of the learning environment it wants to create (in alignment with the intended learning outcomes), before reconsidering the teaching formats.

Even though the number of students is steadily rising, the average intake is still too low. The assessment committee has formulated suggestions to increase this number. The committee is pleased to hear that students generally feel well supported during their studies. The committee observed that there is a good system of study guidance in place, distinguishing between different students with different needs. Study progress is closely monitored and hardly any students leave the programme early. Although completion rates are very good, the committee advises the programme to dispel possible hurdles hampering study progress such as schedule problems and overlap between courses offered by different faculties. In the opinion of the committee, the programme management must work hard to resolve these problems. Tight connections between the faculties are also of paramount importance to fine-tune the learning outcomes of the courses to the learning outcomes of the programme.

The committee is impressed with the academic staff delivering the programme. The number of lecturers who obtained a teaching qualification (at present: 48%) leaves room for improvement. Teaching qualifications show that the programme takes the quality of teaching seriously. On the other hand, the teaching and research facilities are excellent.

The committee has assessed to what extent students and graduates are involved in the evaluation of the programmes. Students are frequently asked to evaluate the programme, not only at course level, but also at the level of the curriculum. The committee suggests that the programme could expand their 3-tier system of quality control with a fourth one by including alumni. The committee expects that contacts with alumni once they have started their professional career will lead to identifying potential stumbling blocks in the composition of the programme and to formulating improvement measurements.

The assessment committee concludes that the Programme Committee takes an adequate role in the process of quality assurance, but is not fully representative. The assessment committee urges the Committee to appoint at least one international student member.

Standard 3 Assessment and achieved learning outcomes
The committee finds the assessment procedure adequate. Students are well informed about assessment procedures and they appreciate the various assessment techniques.
Assessment forms in the master's programme match the learning aims of the courses and those of the programmes. The committee considered exams in the master's programme to be of a high standard. It was also content with the fact that for each exam there are test matrices available containing, for instance, model answers.

The committee is happy to hear that the Board of Examiners plans to implement policy on detecting fraud and/or plagiarism.

The introduction of a new assessment form for the assessment of the master's research project in September 2011 has led to more clarity on what the final grades are based on. The committee was very impressed with this assessment form, which makes a clear distinction between 31 aspects which are taken into consideration when grading both the scientific and the general academic character of the research project, the report and the oral presentation. The committee would find it desirable if members of Master Assignment Committee filled in their assessment forms individually before reaching a consensus about the final grades, so as to ensure an independent judgment of all members.

To assess the level achieved by the students, the committee examined a range of master's theses. Based on the master theses the committee has studied and the extra session with the examiners, it concludes that the theses match the level that may be expected of a graduate of an academic master's degree programme in nanotechnology.

Aanbevelingen
De NVAO onderschrijft de aanbevelingen van het panel.

Besluit

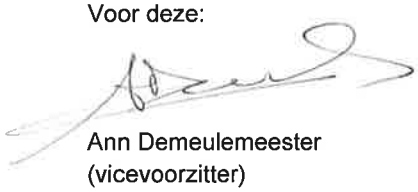
Ingevolge het bepaalde in artikel 5a.10, derde lid, van de WHW heeft de NVAO het college van bestuur van de Universiteit Twente te Enschede in de gelegenheid gesteld zijn zienswijze op het voornemen tot besluit van 3 november 2014 naar voren te brengen. Van deze gelegenheid is geen gebruik gemaakt.

De NVAO besluit accreditatie te verlenen aan de wo-master Nanotechnology (120 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.

 Bijlage 1: Schematisch overzicht oordelen panel

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.

 Bijlage 2: Feitelijke gegevens

Intake:

Year[1]	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
International	6	2	3	3	3	7	4	4	3	7	4	46
BSc Advanced Technologie					1	2	1	2	2	5	4	17
BSc Scheikundige Technologie					1	1						2
BSc Technische Natuurkunde							1					1
BSc Elektrotechniek					1							1
BSc Informatica				1								1
HBO BSc					1			1	3	2	2	9
Total	6	2	3	4	7	10	6	7	8	14	10	77

Success rates:

Cohort[1]	2003	2004	2005	2006	2007	2008	2009	2010	Average
Efficiency at 2 years	3/6	2/2	2/3	3/4	3/7	4/10	4/6	2/4	23/42
	50 %	100%	67 %	75 %	43 %	40 %	67%	50 %	55 %
Efficiency at 2.5 years	6/6	2/2	2/3	3/4	5/7	7/10	6/6	4/4	35/42
	100 %	100%	67 %	75 %	71 %	70 %	100 %	100 %	83 %
Efficiency at 3 years	6/6	2/2	3/3	3/4	6/7	10/10	6/6	4/4	40/42
	100 %	100%	100 %	75 %	86 %	100 %	100 %	100 %	95 %

Teacher-student ratio achieved

	Applied Physics	Chemical Engineering	Electrical Engineering	Nanotechnology
Contribution to Nanotechnology	50%	30%	20%	
Student/staff ratio	15.2	14.8	12.8	14.6

Average amount of face-to-face instruction per stage of the study programme

Year	1	2
Hours	14.5	n/a*

* During the second year, students are working on their internship and master thesis project.

Qualifications of the teaching staff:

Percentage of PhD:

Category	Numbers (m/f)	Total	FTEs	Percentage PhD
Professor (HL)	8 / 0	8	7.2	100%
Associate professor (UHD)	5 / 1	6	6.0	100%
Assistant professor (UD)	8 / 1	9	8.8	100%
Other lecturers	4 / 1	5	5.0	0%
Total	25 / 3	28	27.0	84%

Percentages of basic teaching qualification:

	Number	Percentage	
Received their BKO-certificate	9	36%	64%
Exemption from the course	4	16%	
Have an equivalent degree	3	12%	
Have started their course	6	24%	36%
Did not start yet	3	12%	

Bijlage 3: panelsamenstelling

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

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