

## Besluit

### Besluit strekkende tot het verlenen van accreditatie aan de opleiding wo-master Chemistry van de Radboud Universiteit Nijmegen

#### Gegevens

<b>datum</b>	Naam instelling	: Radboud Universiteit Nijmegen
19 augustus 2013	Naam opleiding	: wo-master Chemistry (120 EC)
<b>onderwerp</b>	Datum aanvraag	: 11 december 2012
Besluit	Variant opleiding	: voltijd
accreditatie wo-master	Locatie opleiding	: Nijmegen
Chemistry van de Radboud	Datum goedkeuren	
Universiteit Nijmegen	panel	: 27 maart 2012
(001128)	Datum locatiebezoeken	: 15 en 16 mei 2012
<b>uw kenmerk</b>	Datum visitatierapport	: 6 november 2012
mso/rg/12U.015868	Instellingstoets kwaliteitszorg	: ja, positief besluit van 21 november 2011
<b>ons kenmerk</b>		
NVAO/20132674/AH		

#### bijlagen

#### Beoordelingskader

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

#### Bevindingen

De NVAO stelt vast dat in het visitatierapport informatie deugdelijk en kenbaar is gemotiveerd op welke gronden het panel de kwaliteit van de opleiding voldoende heeft bevonden. Het visitatierapport geeft de bevindingen en overwegingen weer van het panel over de bacheloropleiding Scheikunde resp. de masteropleiding Chemistry, de bachelor- en masteropleiding Moleculaire Levenswetenschappen en de bacheloropleiding Science resp. de masteropleiding Natuurwetenschappen van de Radboud Universiteit Nijmegen. Het panel heeft deze opleidingen gezamenlijk beoordeeld.

#### Advies van het visitatiepanel

Samenvatting bevindingen en overwegingen van het panel (hierna ook: the committee).

#### *Intended learning outcomes*

Atomic and molecular structure and interaction are key concepts in the programmes in Chemistry, Molecular Life Sciences and Natural Sciences.

The master's programme prepares students for professional practice in the fields of generating knowledge (fundamental and applied research), transfer of existing knowledge (communication and education) and use of existing knowledge (business and

#### Inlichtingen

Ed Lansink  
+31 (0)70 312 23 60  
e.lansink@nvaio.net

Parkstraat 28 | 2514 JK | Postbus 85498 | 2508 CD Den Haag  
P.O. Box 85498 | 2508 CD The Hague | The Netherlands  
T + 31 (0)70 312 2300 | F + 31 (0)70 312 2301  
info@nvaio.net | www.nvaio.net

Pagina 2 van 8 management). To this end, four directions exist in the master's programmes, each with additional qualifications students acquire on top of the competences obtained by every Master of Science in their field.

Next to opting for one of the master directions, students also select a specialization. Currently the students choose their internship in various chemistry-, biology-, medicine- and physics-oriented research groups associated with the educational institute of Molecular Sciences (MW). In future, they will be opting for one of the newly developed master tracks.

The committee finds that the intended learning outcomes of the three different programmes are well described in terms of level and orientation. They comply with the domain specific framework and international requirements.

The committee values that the bachelor's programmes aim to provide the students with a broad education, whereas the master's programmes focus more on the research spearheads of the research groups related to the programme. Consequently, there is a strong link between education and research. The committee welcomes that new master tracks have been designed, making the profile of the master's programmes more focused. In this way, the educational institute MW follows national guidelines. Still, the committee advises the institute to continuously monitor that the learning outcomes of the programmes offer the right balance between focussing on research and aiming at the broadness graduates need to find a job in industry or pursue a master- or PhD-degree at another university.

The committee appreciates that the faculty of Science works with different master orientations, allowing students to orient themselves towards different professional careers.

#### *Teaching learning environment*

The committee values highly that the educational institute MW offers a common molecular core to all three programmes, giving students the opportunity to switch between programmes. Moreover, the committee lauds that students with different backgrounds follow courses together and make assignments in mixed groups, thus promoting the multidisciplinary of students.

However, the committee is of the opinion that the educational institute MW should continue to look for an ideal pairing of broadness of the programme on the one hand, and depth and links with ongoing research on the other hand. This is especially the case for the Chemistry master's programme, where the committee thinks that the current choice of courses as well as the weight attributed to these courses, is too much oriented towards PhD-tracks at Nijmegen University and thus limits students' future employment in industry or at other universities.

One way to achieve this is to make the offered courses more balanced. At the master level, the committee finds the share of courses related to one specific topic (NMR) oversized, whereas the space foreseen for other basic topics and disciplines such as inorganic chemistry, polymer chemistry and physical chemistry, is limited. Some courses the committee finds essential have the same weight in the programme as subjects that are less related to the core of the programme. The committee considers this a shortcoming in the programme that should be taken into account when adjusting the curriculum. According to the committee, the programme requirements have to be formulated in such a way, that

Pagina 3 van 8 students cannot exclusively follow courses from one specific discipline (aimed at in-house research), while excluding courses on other basic topics from their programme.

Another way to broaden the horizon of the students is to ensure that students develop a mobile attitude during their education. In this context, the committee advises the educational institute MW to stimulate more students to do an extramural internship. In addition, initiatives should be taken to attract more students from other institutes, both for internships and registration for the master's programme.

The committee found that the weight attributed to courses is mostly well-balanced, although the committee learnt that there are some exceptions, which are mostly due to the recent standardization of courses to units of 3 or 6 EC. The committee therefore advises the educational institute MW to closely monitor whether the amount of EC attributed to courses throughout the programme is representative for the time invested by students. Also, the committee thinks that offering too many 3 EC-courses may lead to a fragmentation of the students' knowledge on certain topics. Against this background, the committee advises that unnecessary fragmentation and overlap of courses should be avoided.

The committee values that students have an important responsibility in composing their own programme, and obtained ample proof that students receive the necessary guidance in composing their programme. The committee advises the programmes to continue the quality assurance in this regard, especially for the non-required part of the programme.

Internships take up an important part of the curriculum and in general, students are pleased with the supervision they received. This is lauded by the committee. For some of the bachelor's and master's theses the committee read, it was found that the subjects of the projects were too complicated and not adequately delineated. Consequently, the committee suggests that the educational institute MW looks for a way to ensure the quality and feasibility of the suggested themes. The committee thinks the latter is crucial as they should aim to give students an attractive and instructive first taste of scientific research, and to motivate students to continue into that direction.

The teaching format and methods are, according to the committee, adequate and the learning environment is of good quality.

The committee noted that the educational institute MW has started the process of improving the internationalization of the programmes.

The committee saw that the educational institute MW invests in its recruitment policy, which has led to an increased intake in the Chemistry and Molecular Life Sciences programmes in the last few years. The committee values highly that in the master's programme, students can complete their whole training as a first degree pre-university teacher. However, the committee believes that the information strategy regarding all the orientations other than the research orientation needs to be improved to benefit enrollment.

The committee is convinced that the study progress at the bachelor as well as the master level can be improved upon. The committee appreciates that the educational institute MW has already taken a series of measures to improve success rates.

Overall, the committee concludes that the existing assessment system, the level of the bachelor and master theses and the performance of graduates in the master's programme and in professional life, demonstrate that the achieved level of the bachelor's and master's programmes is adequate.

The committee was pleased to find that, in response to the findings of the previous programme evaluation in 2006-2007, a standard evaluation form has been developed for the evaluation of the bachelor's and master's theses. Furthermore, the decision to require the second evaluator of each thesis to come from a different research group is lauded. The committee was also pleased that the overall grades given to the bachelor's and master's theses generally corresponded well with the assessment of the same reports by the committee members.

Still, the committee found that in a number of cases, the individually gradable items were not appropriately assessed. The committee advises the Examination Board to include the evaluation forms in its quality control system and ensures that a concise but adequate motivation is provided for the marks that have been given, including the marks for the subcriteria. Also, the committee recommends that the gradable items are modified so they correspond better to specific required sections in the reports.

Moreover, the committee observed that several bachelor's and master's reports lacked certain sections that one would expect in every report, irrespective of specific research area, like abstract, objectives, conclusion or a statement of future outlook. The committee advises to develop a set of explicit guidelines for the preparation of the bachelor and master thesis, with specific attention to the required sections and what aspects should be covered in each. Furthermore, the committee advises to update the evaluation form, so that these additional 'points of attention' are included in the evaluation and result in a uniformly used, transparent document.

The committee was impressed by the maturity and openness of the selected students and alumni during the interviews. Concerning the level attained by the graduates, the committee advises the educational institute MW to monitor whether the new programme, with its broad set-up, still leads to graduates that can level with their monodisciplinary peers.

Standard 1 (Intended learning outcomes): satisfactory

Standard 2 (Teaching-learning environment): satisfactory

Standard 3 (Assessment and achieved learning outcomes): satisfactory

General conclusion: satisfactory

### **Aanbevelingen**

De NVAO onderschrijft de aanbevelingen van het panel, in het bijzonder die met betrekking tot het bewaken van een goed evenwicht tussen breedte en diepte, de kwaliteit en haalbaarheid van scriptieonderwerpen, het consequent hanteren en invullen van beoordelingsformulieren bij scripties, het periodiek evalueren daarvan door de Examencommissie en het gebruiken van een vast format voor scripties.

Pagina 5 van 8 **Besluit**

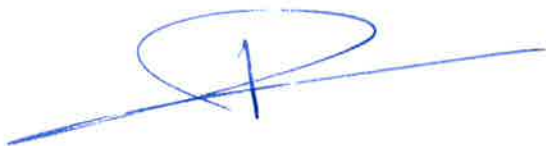
Ingevolge het bepaalde in artikel 5a.10, derde lid, van de WHW heeft de NVAO het college van bestuur van de Radboud Universiteit Nijmegen te Nijmegen in de gelegenheid gesteld zijn zienswijze op het voornemen tot besluit van 17 juni 2013 naar voren te brengen. Bij e-mail van 8 augustus 2013 heeft de instelling van de gelegenheid gebruik gemaakt om te reageren. Dit heeft geleid tot enkele redactionele aanpassingen en aanvullingen op bijlage 2.

De NVAO besluit accreditatie te verlenen aan de wo-master Chemistry (120 EC; variant: voltijd; locatie: Nijmegen) van de Radboud Universiteit Nijmegen te Nijmegen. 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 2019.

Den Haag, 19 augustus 2013

De NVAO  
Voor deze:



R.P. Zevenbergen  
(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.

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	V <i>voltijd</i>
<b>2. Onderwijsleeromgeving</b>	Het programma, het personeel en de opleidingsspecifieke voorzieningen maken het voor de instromende studenten mogelijk de beoogde eindkwalificaties te realiseren	V
<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: Rendement**

<b>Cohort</b>	2007	2008	2009
<b>Rendement</b>	57%	89%	91%

**Tabel 2: Docentkwaliteit**

<b>Graad</b>	<b>Ma</b>	<b>PhD</b>	<b>BKO</b>
<b>Percentage</b>	>99%	>99%	60%

**Tabel 3: Student-docentratio**

<b>Ratio</b>	20,7:1
--------------	--------

**Tabel 4: Contacturen**

<b>Studiejaar</b>	1	2
<b>Contacturen</b>	20	20

- prof.dr. E. Schacht (chair), Honorary Professor, field of expertise: Polymer Science, Ghent University, Belgium;
- prof. dr. J. Heck (member), Full Professor Anorganic and Applied Chemistry, Universität Hamburg, Germany;
- prof.dr. P. Kenis (member), Full Professor and dean, Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, USA;
- dr. G. Van Lommen (member), senior director Medicinal Chemistry, Galapagos;
- Nicky Oppers (student-member), bachelor student Chemical Engineering, Eindhoven University of Technology, the Netherlands.

The committee was supported by dr. J. De Groof, who acted as secretary. The cluster coordinator was dr. B. van Balen.