

Besluit

Besluit strekkende tot het verlenen van accreditatie aan de opleiding wo-bachelor Natuur- en Sterrenkunde van de Universiteit Utrecht

Gegevens

datum	Naam instelling	: Universiteit Utrecht
28 november 2014	Naam opleiding	: wo-bachelor Natuur- en Sterrenkunde (180 ECTS)
onderwerp	Datum aanvraag	: 5 december 2013
Definitief besluit	Varianten opleiding	: voltijd
accreditatie wo-bachelor	Locatie opleiding	: Utrecht
Natuur- en Sterrenkunde	Datum goedkeuren	
Universiteit Utrecht	panel	: 4 november 2013
(002244)	Datum locatiebezoeken	: 12 november t/m 14 november 2013
uw kenmerk	Datum visitatierapport	: 19 februari 2014
-	Instellingstoets kwaliteitszorg	: ja, positief besluit van 12 juli 2012
ons kenmerk		
NVAO/20144074/ND		

bijlagen

- 3 Beoordelingskader voor de beperkte opleidingsbeoordeling van de NVAO (Stcr. 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 (hierna ook: the committee).

Standard 1

The bachelor's degree programme Physics & Astronomy aims at providing students with a broad, basic knowledge of physics, mainly to prepare them to successfully enrol in a master's (research) programme. There are no separate tracks. Students choose from one of six study paths, which prepare them for one of the four master's programmes within the Utrecht University master's degree programme Physics and Climate Science, or a physics or astronomy master's degree programme elsewhere.

The committee has expressed its concern about the lack of adequate job orientation and about the number of changes the programme recently has gone through. It urges the management to focus on stability and contents now, rather than trying to attract students by, for instance, new name changes.

Pagina 2 van 10 Since the previous assessment committee also concluded that more attention should be paid to job orientation (especially outside research), the committee urges the programme management to critically reflect on how job orientation can get a more secure and prominent place in the curriculum. Also, it encourages the programme to formulate which skills students acquire and how these can be valued and put into use in a research or corporate environment.

The committee has studied the intended learning outcomes of the programmes and concludes that they are in line with the domain specific framework of reference and meet international standards.

Standard 2

The bachelor's degree programme Physics & Astronomy consists of 180 EC, evenly divided over three years. The curriculum of the bachelor's degree programme is composed of three parts: a mandatory part (90 EC), an elective set of courses within the programme (45 EC) and a so-called 'optional course profile' (45 EC). All bachelor's courses (except for the bachelor's research project) account for 7.5 EC, allowing students to follow two courses next to each other and to take eight courses a year (60 EC).

There are no official tracks within the bachelor's degree programme. However, by choosing certain mandatory and elective courses, there are six study paths preparing for a master's programme in Physics & Astronomy. These study paths are: (1) Theoretical Physics, (2) Experimental Physics, (3) Nanomaterials, (4) Climate Physics, (5) History and Philosophy of Science, and (6) Astrophysics. To better prepare students for their study path, a new mandatory course will commence in 2013/2014. In their second year, students will choose 'structure of matter' or/and 'fluid dynamics'.

The committee concludes that the content and design of the bachelor's degree programme ensure that students are able to obtain the intended learning outcomes. The programme is well-structured, cohesive and varied, and offers ample opportunity to students to pursue personal interests and talents. There is a clear connection between the aims of the courses and the learning aims of the programme. Excellency programs (the TWIN programme and the bachelor honours programme) guarantee that talented students are sufficiently challenged. The committee advises the programme management to make sure that the various study paths and learning lines do not create a too complicated structure. Finally, the committee underlines the importance of a basic knowledge of astronomy for all bachelor students of physics. The committee is of opinion that the management should be very clear about the position of astronomy in the programme.

The committee concludes that there is an adequate system of study guidance in place. It is pleased to hear that students generally feel well supported in scheduling their programme. Completion rates of the programme are low, mainly because of a delay during the research project at the end of the bachelor's degree programme. Appropriate solutions are being implemented to reduce this delay. The committee is confident that these solutions will improve the completion rates and urges the management to actively keep trying to attract more female students and female staff.

The committee is very impressed with the academic staff delivering the programme. The educational policy of Utrecht University encourages lecturers to obtain not only a basic, but also a senior teaching qualification (SKO in addition to BKO).

Pagina 3 van 10 Almost half of the academic staff has obtained this qualification. This shows that the programme is very much dedicated to the quality of teaching.

The committee concludes that the teaching facilities are adequate, but dated. It is happy to learn that the programme will move into a new building, probably in 2015. The new set-up of the physics labs sets high demands on the technical and support staff, which has been reduced in size. To avoid future problems, the committee advises the programme management to evaluate the new set-up of the physics labs with the teachers and technical staff concerned and implement changes if necessary.

The committee concludes that the Education Advisory Committee functions well and that students are generally well involved in the shaping and evaluation of the programme. Nevertheless, two changes are necessary. Firstly, the committee thinks that students in the Educational Committee (and preferably also in the Educational Advisory Committee) should be elected, so as to guarantee that they can function as spokespersons for the student population that they represent. Secondly, the committee stresses the need for the programme management to try and improve the response rates to course evaluations and involve alumni in the process of evaluating the programme as a whole.

Standard 3

The committee finds the system of testing adequate. The examinations in the bachelor's degree programme match the learning objectives of the courses. Exams are of a high quality and the management is working hard to improve the quality assessment cycle concerning testing. Students are well informed about assessment procedures. The introduction of new assessment forms, provided by the Undergraduate School for the assessment of the thesis project, should lead to more clarity on what the final grade is based on. According to the committee this form needs to be better implemented and better formalized.

The committee finds the structure of two Boards of Examiners and one Sub Board of Examiners Physics & Astronomy complicated and stresses that it should be clear to students what the division of responsibilities is¹. It is impressed by the initiatives taken by the Assessment Advisory Board. Finally, it suggests that the quality of exams should not only be checked afterwards, but could already be improved beforehand by making it custom to have exams checked by a second reader.

To assess the level achieved by the students, the committee examined a range of bachelor's theses. In general, it agrees with the marks that have been given and concludes that the final level of the theses matches with what can be expected of a graduate of an academic bachelor's degree programme. It urges the programmes not to tolerate students taking longer over their bachelor's research project in order to get a higher grade. In this respect, the committee is hopeful that the recently adopted Research Project Application Form will also help students to finish their theses in time. Finally, the committee is of the opinion that a cum laude rate of around 5% would be much more realistic than the current 30%.

¹ De instelling heeft de NVAO erop gewezen dat er sinds 2012 slechts één bachelor examencommissie is (board of Examiners) voor alle bèta bacheloropleidingen en één deexamencommissie natuur- en sterrenkunde. Eerder heeft de instelling de visitatiecommissie hierop geattendeerd.

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 vervolgoopleidingen dan een doorstroommaster aan dezelfde instelling of voor een veelheid aan posities op de arbeidsmarkt.

Tevens vraagt de NVAO aandacht voor de aanbeveling aan de Examencommissie om de wettelijke taken volledig uit te voeren alsmede om in het kader van de eigen interne kwaliteitszorg de realisatie van de verbeterplannen die betrekking hebben op de rol van de Examencommissie en het toetsbeleid te bewaken. De commissie geeft daarbij vier aandachtspunten mee, ze betreffen: het beoordelingsformulier voor de thesis, de inzet van een onafhankelijke tweede thesisbeoordelaar, een kwaliteitscheck op toetsen door een tweede lezer vóór afname en naleving van eenduidige regels rond herkansing.

Besluit

Ingevolge het bepaalde in artikel 5a.10, derde lid, van de WHW heeft de NVAO het college van bestuur van de Universiteit Utrecht te Utrecht in de gelegenheid gesteld zijn zienswijze op het voornemen tot besluit van 3 november 2014 naar voren te brengen. Bij e-mail van 24 november 2014 heeft de instelling van deze gelegenheid gebruik gemaakt. Dit heeft geleid tot enkele tekstuele aanpassingen.

De NVAO besluit accreditatie te verlenen aan de wo-bachelor Natuur- en Sterrenkunde (180 ECTS; variant: voltijd; locatie: Utrecht) van de Universiteit Utrecht te Utrecht. De NVAO beoordeelt de kwaliteit van de opleiding als voldoende.

Dit besluit treedt in werking op 28 november 2014 en is van kracht tot en met 27 november 2020.

Den Haag, 28 november 2014

De NVAO

Voor deze:

Anne Flierman
(voorzitter)



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

Bachelor's programme Physics and Astronomy

Total intake, including double-major programme (TWIN)

Year	Total	Male	Female
06/07	116	91	25
07/08	96	69	27
08/09	102	87	15
09/10	126	96	30
10/11	142	120	22
11/12	127	107	20
Total	709	570	139

Source: Osiris

Graduated, still registered and stopped

Year	Cohort size	Graduated*	Still registered	Stopped
06/07	116 (35)	68 (24)	6 (0)	42 (11)
07/08	96 (32)	54 (16)	6 (3)	36 (16)
08/09	102 (44)	45 (30)	18 (5)	39 (9)
09/10	126 (48)	24 (15)	52 (16)	50 (17)
10/11	142 (57)	4 (0)	79 (2)	59 (2)
11/12	127 (51)	1 (0)	87 (2)	39 (2)
Total	709	196	248	

Source: Osiris

* including students who switched from the double-major programme (TWIN) to the bachelor's degree programme Mathematics after the first year: 2006 (1), 2008 (1), 2009 (2). Numbers in between brackets refer to TWIN students.

Stopped

Year	Cohort size	After one year (number)	After one year (%)	Total
06/07	116	30	26%	42
07/08	96	25	26%	36
08/09	102	30	29%	39
09/10	126	43	34%	50
10/11	142	49	35%	59
11/12	127	39	31%	39

Source: Osiris

Exams per year / output

06/07	07/08	08/09	09/10	10/11
62	57	86	72	82

Average duration in months

Cohort	Cohort size	Graduated	Duration
06/07	116	68 (24)	49
07/08	96	54 (16)	48
08/09	102	45 (30)	43
09/10	126	24 (15)	37
10/11	142	4 (0)	23
11/12	127	1 (0)	10

Master's programmes Physics and Climate Science

Total intake of the master's programmes

	Own university	Other universities (NL)	HBO	Outside HE (international)	Total
2006/07	35	2	0	7	44 (9)
2007/08	49	5	0	9	63 (11)
2008/09	46	1	1	14	62 (18)
2009/10	53	13	0	16	82 (16)
2010/11	34	3	0	7	44 (5)
2011/12	34	7	0	19	60 (13)

Intake per academic year, including students Nanomaterials-Physics, all intake moments
Numbers between brackets refer to female students

Throughout of the programme Theoretical Physics

Year	Cohort size	From own university		From other universities (NL)		From HBO		From outside HE (internat.)	
		Graduated	Still registered	Graduated	Still registered	Graduated	Still registered	Graduated	Still registered
2006/07	28	16	0	-	-	-	-	5	0
2007/08	30	18	1	1	0	-	-	5	0
2008/09	23	11	1	-	-	-	-	5	0
2009/10	31	11	5	0	1	-	-	6	0
2010/11	27	8	8	0	1	-	-	3	4
2011/12	29	1	14	0	2	-	-	0	9
2012/13	30	0	19	0	1	-	-	0	10

Throughout of the programme Particle Physics

Year	Cohort size	From own university		From other universities (NL)		From HBO		From outside HE (internat.)	
		Graduated	Still registered	Graduated	Still registered	Graduated	Still registered	Graduated	Still registered
2006/07	7	3	0	-	-	-	-	-	-
2007/08	8	5	0	-	-	-	-	-	-
2008/09	10	4	0	-	-	-	-	0	0
2009/10	8	2	2	-	-	-	-	1	0
2010/11	6	3	0	-	-	-	-	1	1
2011/12	6	0	3	-	-	-	-	0	3
2012/13	4	0	4	-	-	-	-	-	-

Throughput of the programme Meteorology, Physical Oceanography and Climate

Year	Cohort size	From own university		From other universities (NL)		From HBO		From outside HE (internat.)	
		Graduated	Still registered	Graduated	Still registered	Graduated	Still registered	Graduated	Still registered
2006/07	6	4	0	1	0	-	-	-	-
2007/08	14	9	0	3	0	-	-	2	0
2008/09	20	13	0	1	0	1	0	2	0
2009/10	26	12	0	9	0	-	-	4	0
2010/11	7	3	1	2	0	-	-	0	0
2011/12	14	0	3	0	3	0	1	0	6
2012/13	23	0	13	0	3	-	-	0	7

Programme performance of the master's programmes Physics and Climate Science

Cohort	Cohort size at 1 October	Yield after 1 year (%)	Yield after 2 years (%)	Yield after 3 years (%)	Yield after 4 years (%)
2006/07	38	3	34	82	89
2007/08	57	12	39	79	86
2008/09	48	8	48	81	85
2009/10	69	7	39	80	
2010/11	41	2	49		
2011/12	53	4			

Output of the master's programmes Physics and Climate Science

Year	From own university		From other universities (NL)		From HBO		From outside HE (internat.)	
	Graduated	Average duration	Graduated	Average duration	Graduated	Average duration	Graduated	Average duration
06/07	7	22	1	31	0	-	7	27
07/08	31	20	0	-	0	-	10	33
08/09	41	23	2	26	0	-	5	40
09/10	40	26	3	30	0	-	11	26
10/11	29	28	3	24	0	-	8	28
11/12	43	29	9	25	1	35	12	31

Teacher-student ratio achieved

Teaching staff quality

Grade	MA	PhD	BKO
Percentage	100%	96%	83%

Source: Human Resources, Faculty of Science

On November 1, 2012, the number of bachelor students Physics and Astronomy was 379 (source: Osiris). (The number of students in the master degree programme Physics and Climate Science was 134 (source: Osiris), and thus the total number of students was 513.)

The total size of available teaching staff (in fte units) on November 1, 2012, was 20,0 (source: Dpt. of Human Resources). Within the teaching staff no division is made between master and bachelor teaching.

Pagina 9 van 10 This yields as student-teaching staff ratio: $379/20=19,0$, if only bachelor students are counted, or $513/20=25,7$ for all (bachelor and master) students.

Ratio	379 students (2012) / 20,0 fte = 19,0 (only bachelor students counted)
	513 students (2012) / 20,0 fte = 25,7 (bachelor and master students counted)

Source: Osiris (students) and Human Resources, Faculty of Science (staff)

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

	Year 1 (Bachelor) Hours per student in this year	Year 2 (Bachelor) Hours per student in this year	Year 3 (Bachelor) Hours per student in this year
Lectures	288	270	222
Working classes	324	326	268
Physics Lab	117	72	18
Assessments/exams	28	26	20
Total contact time	757	694	528

The table below shows average number of contact hours for a typical 7.5 EC course

	Number of hours per student
Lectures	32
Tutorials	32
Assessment/exams	3
Total contact time	67
Total time of the course (7.5 EC)	210

- Prof. dr D. Lenstra is professor emeritus in Electrical Engineering (Delft University of Technology) and fellow of the Eindhoven University of Technology.
- Prof. dr G. Borghs is professor emeritus in Physics at the KU Leuven (BE) and senior fellow of the Inter-university Micro Electronics Centre (imec).
- Prof. dr T. Theuns is reader Astrophysics at Durham University (UK) and part-time professor Astrophysics University of Antwerp (BE).
- Dr H.P. Blok, retired associate professor at VU-university, Amsterdam;
- Dr J. Hoogenraad is owner of Spoorgloren BV.
- J.J.T. Wagenaar MSc, student member, is PhD-student in Physics, Leiden University.

extended with an expert on the subject Meteorology, Physical Oceanography and Climate:

- Prof. dr J. Pietrzak is professor in Physical Oceanography at Delft University of Technology.

Het panel werd ondersteund door dr J. Corporaal, secretaris, onder supervisie van dr. B.M. van Balen, secretaris (gecertificeerd).