nvao
nederlands - vlaamse accreditatieorganisatie

Accreditatierapport en -besluit met een positieve beoordeling van de accreditatieaanvraag voor de opleiding Master of Science in de ingenieurswetenschappen: fotonica / Master of Science in Photonics Science and Engineering (master) van de Universiteit Gent en de Vrije Universiteit Brussel

datum
15 september 2011
onderwerp
Accreditatierapport en -besluit (#4859)
bijlage
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1. Inleiding

Bij brief van 1 februari 2011 heeft het instellingsbestuur van de Universiteit Gent te Gent mede namens de Vrije Universiteit Brussel te Brussel een accreditatieaanvraag ingediend bij de Nederlands-Vlaamse Accreditatieorganisatie (NVAO) voor de opleiding Master of Science in de ingenieurswetenschappen: fotonica / Master of Science in Photonics Science and Engineering (master). Het betreft een interuniversitaire masteropleiding georganiseerd te Gent (Universiteit Gent) en te Brussel (Vrije Universiteit Brussel). Deze aanvraag is ontvangen op 3 februari 2011 en ontvankelijk verklaard op 22 februari 2011.

De accreditatieaanvraag steunt op het visitatierapport van een externe beoordeling uitgevoerd door een visitatiecommissie ingesteld door de Vlaamse Interuniversitaire Raad (VLIR).

De visitatiecommissie kende de volgende samenstelling:
Voorzitter:
- prof. dr. Ignas Niemegeers, hoogleraar Mobile and Wireless Communication, TU Delft;

Leden:
- prof. dr. Paul Regtien, hoogleraar Elektrische Metingen en Instrumentatie, Universiteit Twente;
- prof. dr. Peter Baltus, hoogleraar en hoofd van het Centre for Wireless Technology, TU Eindhoven;
- prof. dr. Marc Ilegems, emeritus hoogleraar Ecole Polytechnique Fédérale de Lausanne;
- prof. dr. Christian Eugène, emeritus hoogleraar Elektrotechniek UCL, directeur Formation Continu des Ingenieurs aan de UCL en bestuurslid European Association for Education in Electrical and Information Engineering;
- dhr. Benjamin Baert, student Bachelor of Science in de ingenieurswetenschappen: werktuigkunde, met nevenrichting Elektrotechniek, K.U. Leuven.

Secretaris:
- mevr. Ilse De Vooght, stafmedewerker kwaliteitszorg VLIR.

De visitatie heeft plaatsgevonden op 22 tot en met 24 februari 2010. Het visitatierapport dateert van december 2010.

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2. Formele overwegingen

De NVAO komt tot de volgende vaststellingen:

- De externe beoordeling is opgesteld en onderbouwd overeenkomstig het toepasselijke Accreditatiekader bestaande opleidingen hoger onderwijs Vlaanderen van de NVAO en volgens de daarbij behorende beslisregels;
- De visitatiecommissie heeft voor de externe beoordeling het door de VLIR vastgestelde visitatieprotocol gevolgd;
- De externe beoordeling verschaft inzicht in de samenstelling van de visitatiecommissie;
- De externe beoordeling bevat een onderzoek ten gronde naar de aanwezigheid van voldoende generieke kwaliteitswaarborgen

De NVAO is in het licht van het vorenstaande tot de slotsom gekomen dat de externe beoordeling over de voorliggende opleiding regelmatig en gedegen tot stand is gekomen.

3. Inhoudelijke overwegingen

De NVAO steunt haar inhoudelijke besluitvorming in hoofdzaak op de onderstaande elementen uit het visitatierapport.

Doelstellingen

Het panel has noticed that the general objective of the programme is to 'address the societal need for engineers capable of developing innovative systems in which light is used as information or energy carrier.' The panel finds that the objectives of the programme are in accordance with the Flemish Higher Education Act (article 58); the objectives are clearly formulated and situated on a master's level. The panel believes that both students and lecturers are familiar with the objectives of the programme.

The panel states that, given the fact that there are not many European master programmes in Photonics – and the fact that the existing ones are relatively young – there is not yet an established expectation pattern about a master programme in the field of Photonics. The discipline-specific requirements of the objectives are, according to the panel, clearly inspired by the many contacts the programme entertains with 'Photonics 21' (the European Photonics Association: a voluntary association of industrial enterprises and other stakeholders in the field of photonics in Europe). They objectives are derived from the international scientific community and the needs of the industry and society at large. The discipline-specific requirements of the objectives do fit with the reference framework of the panel. The programme has a clear profile and is of added value for the European educational landscape in photonics.

Programma

The programme focuses much on fundamental knowledge development. This knowledge development is clearly research-driven, according to the panel. In-depth knowledge of photonics is provided by the core compulsory course modules followed by further specialisation without giving up the indispensable in-depth knowledge development. The programme pays substantial attention to recent developments in the scientific field of photonics. The lecturers are requested annually to update their course materials as reflected in the ECTS-files. Furthermore, the programme also addresses the development of research skills and attitudes. The panel believes that the programme matches well with the professional world (i.e. the industry).

The panel is of the opinion that the contents of the programme are of a very high quality and that the learning outcomes (or programme competences) are adequately translated in the contents and courses. The programme enables the students to realise the objectives as put forward. In general, the ECTS-fiches are well managed and the students know what is expected from them during their studies. Furthermore, the international dimension is modest but still prominent. The fact that the students have the opportunity to do an internship is viewed very positively by the panel.

The panel finds that the programme is coherent. The contents are taught in a logical and sequential way. The initial emphasis on core photonics courses is followed by advanced photonics courses. There is a good balance between photonics and non-photonics knowledge and skills, between theory and practice, and between fundamental and applied topics. Considerable effort has been spent to ensure that the compulsory core photonics course modules cover – with limited overlap – all the basic knowledge components and associated insights and skills of the discipline of photonics.

The panel notes that at UGent, one credit is systematically translated into 30 hours of study time, while at VUB this is ranging between 25 and 30 hours per credit. Several enquires are held to measure the effective study time. If these enquires reveal significantly deviated study time, necessary actions will be asked. The study time is, according the panel, well distributed among the semesters. For the first year the effective study time counts 1776 hours, while the second year counts for 1960 hours, which is well beyond the threshold (1500 to 1800 hours). The panel believes that the effective and budgeted study times are in accordance with each other, reflecting 60 credits per year. In fact, all students said during the visit that the programme is feasible.

Students with a UGent degree of Bachelor of Science in Electrical Engineering, Bachelor of Science in Engineering Physics or a VUB degree of Bachelor of Science in Applied Sciences and Engineering (Electronics and Information Technology) or an equivalent degree from K.U.Leuven have automatic admission into the programme. Students with a degree of Bachelor of Science in Physics, or a degree of Bachelor of Science in Industrial Sciences: Electronics (or a number of other degrees) can enter on condition of completing a preparatory programme. The panel is of the opinion that the curriculum is adequately aligned with the previous education of most of the incoming students. The preparatory programme is highly adaptable to students with another background.

The panel finds that the didactic concept is in line with the objectives. The formats used are well in tune with the courses and the learning outcomes of these courses, since most courses incorporate several teaching and learning methods, whereby each method contributes to certain competences the students have to acquire. Classical ex-cathedra lectures are mainly used for the transfer of knowledge and insights, while exercise sessions are used to illustrate how this knowledge can be applied in a number of concrete examples. Both stimulate analytical thinking. Project work, lab sessions and computer exercises aim at training the synthetic thinking of the students and their practical skills. Group work also stimulates soft skills like being able to collaborate with others, reporting, ethics, and so on. The quality of the teaching and learning materials and facilities is good, the panel states. Extensive use is made of the electronic environments Minerva (UGent) and PointCarré (VUB).

At UGent a rather large majority of exams are open book exams while at VUB most of the exams are closed book exams, both consisting of a theoretical and a practical part. The theory is often examined orally. For English-taught course modules, the exam will be in English. A significant part of the total score of many modules is given for project or lab work, scientific paper analysis and the making of summaries. There is a *a posteriori* quality check regarding the learning assessment. On the basis of the ECTS-fiches, the interviews during the visit and the exam questions and forms, the panel believes that the learning assessment is well attuned with the learning outcomes of the courses and the objectives of the programme.

The master's thesis counts for 24 credits and as such complies with the Flemish legislation. The subject, or topic, of the master's thesis is chosen by the student and is closely related to the research topics of the involved professor (as advisor). Each master's thesis is evaluated by a board of examiners, taking into account the advice of the guidance committee and using a predefined evaluation form. The board of examiners is composed of the advisor and supervisor(s) and two commissioners. The student needs to present his master's thesis orally before a public audience. The panel consulted a number of master's theses and concludes that they portray a very high scientific quality, and often deal with very advanced topics. The panel finds that the guidance is excellent, without too much steering and thus leaving room for the student's creativity. The panel also finds the assessment of the master's theses very well organised.

Inzet van personeel

After consulting the research output, the panel finds the quality of the research carried out within the different research groups to be very high and to be covering a wide spectrum of specialisations. Academic staff members have numerous international contacts. Most ZAP members who are involved in teaching have a link with the professional environment in one way or another, and their research activity benefits from collaboration with industrial partners.

The general compulsory courses in the first and second year and the elective courses in photonics are taught by 23 lecturers in charge (10 from UGent en 13 from VUB), including 15 ZAP members (7 from UGent and 8 from VUB). Besides the ZAP members, the majority of the people (31) involved in the general compulsory courses are formed by OAP/BAP. The number of about 40 students (together with the Erasmus Mundus: Master of Science in Photonics programme) can be compared with the number of faculty and other academic staff involved. The panel finds that at the UGent en the VUB the quantity of the staff is adequate. All courses are taught by sufficient academic personnel, while the staff members are not overloaded with teaching duties.

The panel finds that the discipline-specific expertise of the lecturers is good, especially because every lecturer does research in the discipline he teaches at one of the universities. The students are also satisfied with the didactical expertise of the lecturers. All staff members have the opportunity to attend training sessions. New assistants are well prepared for their teaching duties by their more experienced colleagues or ZAP members. The panel recommends to have action undertaken regarding the internationalisation of the staff both at UGent and the VUB.

Voorzieningen

The panel visited the facilities of the VUB and the UGent. The class rooms, labs, exercise rooms and libraries are well equipped. To eliminate the burden of travelling between Ghent and Brussels, for some course modules a teleclassing system is used. The panel, however, observed that the teleclassing system still suffers from some technical problems and that the lecturers must be well trained to use such a system in a more appropriate way.

The panel observed that the students are well informed about the programme and that the student guidance is well functioning. The website of the programme is very detailed and offer foreign students all necessary information. The distance between teachers and students is very small at both the UGent and the VUB. Students quickly overcome their initial restraint and are not reluctant to contact the academic staff whenever they encounter didactical problems concerning specific subject matters. Students with psychological and/or social problems can find individual counselling at the university's facilities.

Interne kwaliteitszorg

The panel believes that all instruments, procedures and forums are present to guarantee the quality of the programme. Quality assurance policies are geared towards quality control and the quality improvement, according to the panel. The educational evaluation survey probes the efficiency and effectiveness of the organisation and implementation of the educational process. There is one questionnaire per course module/lecturer combination under evaluation. The results of the surveys are analysed in great detail with all stakeholders. The panel remarks that students should be better informed about the results, analyses and follow-up of the surveys. The panel appreciates the independently organised informal surveys of course modules by the respective teachers.

The panel observed that the programme management takes sufficient measures to guarantee the quality of the programme and has studied the goals and the measures taken. The panel supports all these goals, and believes that they will further increase the quality of the programme.

The panel finds that both lecturers and students are closely involved in the process of internal quality assurance. Both are well represented in the main governing bodies, and are involved in the decision making. Students are heard by surveys and their concerns are fully addressed in the programme management. The involvement of the alumni and of the professional field with the internal quality assurance is well organised, according to the panel. Representatives of these groups are well represented in the Advisory Board of the programme.

Resultaten

On the basis of the meetings with the students, the surveys carried out, the quality of the master dissertations and an analysis of the exam forms and the study materials, the panel concludes that the programme exhibits sufficient generic quality features and that it realises its objectives. Alumni consider the general academic level of the programme as high and were very satisfied with the programme they have enjoyed. The necessary competences and skills are mastered in the course of the programme. There is a good balance between theoretical knowledge and practical skills. The programme contributes to the analytical insight, research skills, problem solving and independence in practicing professional functions and learning. The panel concludes that all graduates reach a high level of obtained competences.

Of the 21 students registered in 2007 in the first year of the Dutch-taught master, 14 received their degree after two years of study. The 14 students started in 2008 in the standard study programme are on track. The target figure for success is 100%. The panel is of the opinion that the success rate of the Dutch-taught master is high. This is largely due to the high levels of motivation of the students, the intense study guidance offered, and the joint efforts of the lecturers to provide good education. Given the English-taught master is new, and there are no graduates yet, success rates are not available. Based on the results of the Dutch-taught master the panel believes that its success rates will be very similar.

Conclusie

De NVAO is in het licht van het vorenstaande tot de slotsom gekomen dat het eindoordeel van de commissie deugdelijk is gemotiveerd. De NVAO kan zich dan ook aansluiten bij de bevindingen en overwegingen voor alle facetten en onderwerpen, zoals verwoord in het visitatierapport. De eindconclusie uit het visitatierapport wordt gevolgd.

4. Oordelen visitatiecommissie

De tabel geeft per onderwerp en per facet het oordeel van de visitatiecommissie weer.

ONDERWERP	OORDEEL	FACET	OORDEEL
1 Doelstellingen opleiding	**voldoende**	1.1 niveau en oriëntatie	goed
		1.2 domeinspecifiek referentiekader	goed
2 Programma	**voldoende**	2.1 eisen gerichtheid	excellent
		2.2 relatie doelstellingen - programma	goed
		2.3 samenhang programma	goed
		2.4 studielast	goed
		2.5 toelatingsvoorwaarden	goed
		2.6 studieomvang	ok
		2.7 afstemming vormgeving - inhoud	goed
		2.8 beoordeling en toetsing	goed
		2.9 masterproef	goed
3 Inzet van personeel	**voldoende**	3.1 eisen gerichtheid	excellent
		3.2 kwantiteit	goed
		3.3 kwaliteit	goed
4 Voorzieningen	**voldoende**	4.1 materiële voorzieningen	goed
		4.2 studiebegeleiding	goed
5 Interne kwaliteitszorg	**voldoende**	5.1 evaluatie resultaten	goed
		5.2 maatregelen tot verbetering	goed
		5.3 betrokkenheid	goed
6 Resultaten	**voldoende**	6.1 gerealiseerd niveau	goed
		6.2 onderwijsrendement	goed

Eindoordeel NVAO: positief

5. Globale oordelen NVAO

De onderstaande tabel geeft per onderwerp het globaal oordeel van de NVAO weer.

ONDERWERP	OORDEEL
1 Doelstellingen	voldoende
2 Programma	voldoende
3 Inzet personeel	voldoende
4 Voorzieningen	voldoende
5 Interne kwaliteitszorg	voldoende
6 Resultaten	voldoende

Eindoordeel NVAO: positief

6. Besluit[1]

betreffende de accreditatie van de Master of Science in de ingenieurswetenschappen: fotonica / Master of Science in Photonics Science and Engineering (master) aangevraagd door de Universiteit Gent mede namens de Vrije Universiteit Brussel. Het betreft een interuniversitaire opleiding georganiseerd te Gent (Universiteit Gent) en Brussel (Vrije Universiteit Brussel).

De NVAO,
Na beraadslaging,
Besluit :

Met toepassing van het decreet van 4 april 2003 betreffende de herstructurering van het hoger onderwijs in Vlaanderen, wordt het accreditatierapport en –besluit met positief eindoordeel voor de opleiding Master of Science in de ingenieurswetenschappen: fotonica / Master of Science in Photonics Science and Engineering (master) van de Universiteit Gent en de Vrije Universiteit Brussel goedgekeurd en wordt de opleiding geaccrediteerd. Het betreft een opleiding zonder afstudeerrichtingen die te Gent en Brussel wordt georganiseerd.

De in het eerste lid bedoelde accreditatie geldt vanaf de aanvang van het academiejaar 2011-2012 tot en met het einde van het academiejaar 2018-2019.

Den Haag, 15 september 2011

Voor de NVAO,

Guido Langouche
(vicevoorzitter)

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[1] Het ontwerp van accreditatierapport werd aan de instelling bezorgd voor eventuele opmerkingen en bezwaren. De instelling heeft bij brief van 7 september 2011 van de gelegenheid gebruik gemaakt om te reageren. Dit heeft geleid tot een tekstuele aanpassing.

 Bijlage 1 – Gegevens opleiding

– naam instelling	Universiteit Gent
– adres instelling	Sint-Pietersnieuwstraat 25 9000 GENT
– aard instelling	ambtshalve geregistreerd
– naam instelling	Vrije Universiteit Brussel
– adres instelling	Pleinlaan 2 1050 BRUSSEL
– aard instelling	ambtshalve geregistreerd
– graad, kwalificatie	Master of Science in de ingenieurswetenschappen: fotonica / Master of Science in Photonics Science and Engineering
– specificatie	of Science
– niveau en oriëntatie	master
– studieomvang	120 studiepunten
– opleidingsvarianten	
– afstudeerrichtingen:	geen
– studietraject voor werkstudenten:	geen
– vestiging opleiding	Gent en Brussel
– onderwijstaal	Nederlands, Engels
– (delen van) studiegebieden	Toegepaste wetenschappen
– bijkomende titel	burgerlijk ingenieur