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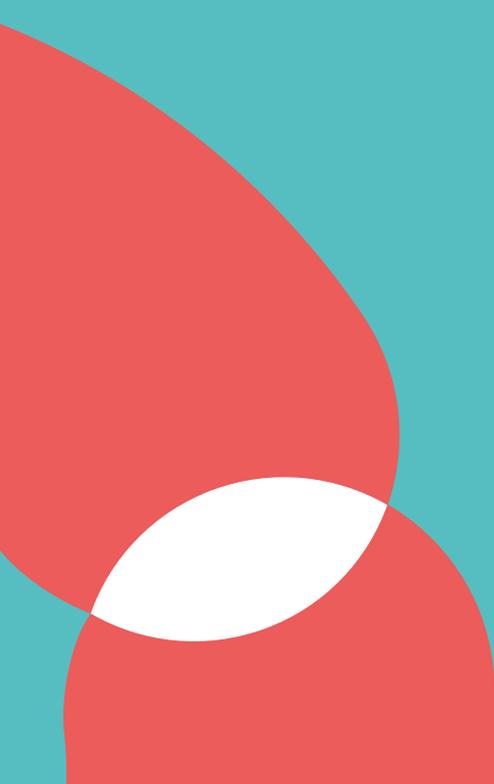
PEER REVIEW NEW PROGRAMME

MASTER SYSTEM DESIGN

Fontys University of Applied Sciences

SUMMARY REPORT

11 March 2022



1 Peer Review

The quality of a new programme is assessed by means of peer review. A panel of independent peers including a student reviews the plans during a site visit to the institution. A discussion amongst peer experts forms the basis for the panel's final judgement and the advisory report. The focus is on the curriculum, the teaching and learning environment, and student assessment.

The Accreditation Organisation of the Netherlands and Flanders (NVAO) takes a formal decision on the quality of the new programme based on the outcome of the peer review. This decision can be positive, conditionally positive or negative. Following a positive NVAO decision with or without conditions the institution can proceed to offer the new programme. Upon completion of the programme graduates are entitled to receive a legally accredited degree.

This summary report contains the main outcomes of the peer review. A full report with more details including the panel's findings and analysis is also available. NVAO bases an accreditation decision on the full report.

Both the full and summary reports of peer reviews are published on NVAO's website www.nvao.net. There you can also find more information on NVAO and peer reviews of new programmes.

Because of COVID-19 temporary measures apply for this peer review.

2 Panel

Peer experts

1. Prof. dr.ir. Han Brezet (*chair*), professor Sustainable Product Innovation, University of Aalborg (Denmark) and professor emeritus of the Faculty Industrial Design, TU Delft;
2. Dr.ir. G.M. Bonnema, PDEng, associate professor Systems Engineering, and Multidisciplinary Design University of Twente;
3. Dr.ir. Adrian Matthias Rankers, managing partner & trainer Mechatronics Academy. CTO Mechatronics, High Tech Institute;
4. Dr. Corina Vogt-van Haarlem, programme manager & lecturer Master Smart Systems Engineering, European Master in Renewable Energy & European Master in Sustainable Energy System Management, Hanze University of Applied Sciences, Groningen;
5. Laura Janssen (*student*), student of the master Civil Engineering and Management, University of Twente.

Assisting staff

- Drs. Riekje de Jong, secretary;
- Drs. Jona Rovers, NVAO policy advisor and process coordinator.

Site visit (online)

January 28th 2022

3 Outcome

The NVAO approved panel reaches a conditionally positive conclusion regarding the quality of the master System Design offered by Fontys University of Applied Sciences. The programme complies with one standard of the limited NVAO framework and partially complies with the other two standards.

The master System Design facilitates students to understand and develop the main functions of high-tech systems and do technical research. The Industrial Board was closely involved in defining the profile. Graduates will develop a personal profile based on an engineering specialism and selected projects. They will have the communication and management skills to work in a multidisciplinary way and coordinate this work, developing and realizing high tech systems after some years.

The master is offered both as a two year full-time programme and as a four year part-time programme. The first year consists of courses combined with a project to apply the acquired knowledge and skills. The graduation project covers the second year and is supported by courses aimed at developing communication and managerial skills. Students will fulfil their graduation project in the industry. With respect to the programme, the panel is in need of some relevant additional information about the curriculum and wants more explanation about the teaching and learning environment in the programme. Therefore, the panel evaluates standard 2 as conditionally positive.

Condition:

The programme should elaborate the overall coherence in the programme, by (1) providing a clear description of the research and system design intended learning outcomes on course level and by (2) providing an answer to the question how supervision and coaching are integrated in the semester projects in the first year.

In addition, the programme should (3) operationalize the professional skills track and show how professional skills are integrated in the courses and first year projects.

The assessment policy of the programme is a good point of departure for validity, reliability and transparency in grading. More operational at the level of the courses and projects, the assessment methods are, according to the panel, still insufficiently developed and described with exception of the written exams. The panel therefore evaluates standard 3 as conditionally positive.

Condition:

The programme should (1) clarify its vision on the potential variety of assessments methods envisaged for application in the program, in such a way that students are enabled to achieve the intended learning outcomes of the master and (2) clarify systematically and in more detail the planned assessment methods of projects, papers and professional skills (communication and managerial skills).

Since the final conclusion is 'conditionally positive', the panel posed a number of conditions (see standards 2 and 3 and the summary in 6.5). The panel, however, is convinced that both management and staff will be able to fulfill these conditions within the set timeframe.

4 Commendations

The programme is commended for the following features of good practice.

1. **Strong relationship with the industry** - the committed Industrial Board is involved in developing the programme, offers project proposals, will provide guest lectures and supervising students.
2. **Project work** - every semester of the programme students are working on a project to apply their achieved knowledge.
3. **Graduation** - the graduation project is embedded in the industry.

5 Recommendations

For further improvement of the programme, the panel recommends a number of follow-up actions, next to the formulated conditions.

1. **Develop a deficiency programme** - students with a bachelor of technical sciences are admitted to the programme but will not always have the appropriate level of knowledge. Develop a deficiency programme that enables motivated bachelor students of other engineering studies to reach the necessary entry level.
2. **Clarify professional skills** - students will also develop professional skills in project work. Clarify in more detail what professional skills are integrated in the learning activities of the first year projects and how these skills will be assessed.
3. **Pay attention to an inclusive learning environment** - although the professional world of the graduates is international, there is less attention in the programme for developing communication skills that facilitate working in an inclusive environment. The panel advises to pay attention to this.

6 What comes next?

NVAO grants initial accreditation to a new programme on the basis of a panel's full report. The decision is valid for a maximum of six years. For conditional accreditation other regulations apply. Upon accreditation the new programme will follow the NVAO review procedures for existing programmes. NVAO publishes the accreditation decision together with the full report and this summary report.¹

Each institution has a system of quality assurance in place ensuring continuous follow-up actions and periodic peer-review activities. Peer reviews help the institution to improve the quality of its programmes. The progress made since the last review is therefore taken into consideration when preparing for the next review. The follow-up activities are also part of the following peer-review report. For more information, visit the institution's website.²

¹ <https://www.nvaio.net/nl/besluiten>

² <https://fontys.edu/>

7 Summary in Dutch

Het panel oordeelt positief onder voorwaarden over de kwaliteit van de master System Design van Fontys Hogeschool. Dit is de uitkomst van de kwaliteitstoets uitgevoerd door een panel van *peers* op verzoek van de Nederlands-Vlaamse Accreditatieorganisatie (NVAO). Voor deze beoordeling heeft het panel online gesprekken gevoerd met de opleiding op 28 januari 2022.

Afgestudeerde masterstudenten System Design zijn opgeleid voor functies in de high-tech industrie. Afgestudeerden ontwikkelen een persoonlijk profiel dat is gebaseerd op hun technisch specialisme en uitgevoerde projecten. Zij hebben communicatieve en managementvaardigheden om in multidisciplinaire teams te werken aan de ontwikkeling en uitvoering van high-tech systemen. Op den duur kunnen zij hierin een coördinerende rol vervullen als *system design architect*. Het werkveld is nauw betrokken bij dit programma. Elk semester in het eerste jaar bestaat uit 2 cursussen met een afrondend project. Het tweede jaar bestaat voornamelijk uit een afstudeerproject dat vaak zal plaatsvinden in de high-tech industrie, met aanvullende cursussen communicatie en managementvaardigheden. Het panel heeft nog wel duidelijkheid gevraagd over de samenhang in het programma, de uitwerking van professionele vaardigheden en de toelichting op een aantal toetsmethoden.

Sterke punten van de opleiding zijn de goede relaties met de high-tech industrie. Naast betrokkenheid bij de ontwikkeling van het afstudeerprofiel, reiken zij projectvoorstellen aan, leveren gastdocenten en zullen ze afstudeerprojecten begeleiden op de werkplek. Ook de afwisseling van cursussen en projecten in het eerste jaar is een sterk punt.

Aanbevelingen zijn om bij de start van de nieuwe opleiding prioriteit te leggen bij de ontwikkeling van het programma voor full-time studenten om voldoende diepgang in de projecten te kunnen waarborgen. En pas in een volgend jaar de opleiding open te stellen voor part-time studenten. Ook kunnen de communicatieve en managementvaardigheden geïntegreerd worden in de projecten waar studenten al in teams werken.

Meer informatie over de NVAO-werkwijze en de toetsing van nieuwe opleidingen is te vinden op www.nvao.net. Voor informatie over de Fontys Hogeschool verwijzen we naar de website van de instelling.³

Als gevolg van de beperkende omstandigheden door COVID-19 geldt voor deze kwaliteitstoets een tijdelijke procedure.

³ <https://fontys.edu/>

The summary report was written at the request of NVAO and is the outcome of the peer review of the new programme professional master System Design of Fontys University of Applied Sciences

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Nederlands-Vlaamse Accreditatieorganisatie
Accreditation Organisation of the Netherlands and Flanders

Parkstraat 83 • 2514 JG Den Haag
P.O. Box 85498 • 2508 CD The Hague
The Netherlands

T +31 (0)70 312 23 00
E info@nvaio.net
www.nvaio.net