



NVAO  THE NETHERLANDS

# INITIAL ACCREDITATION

WO-BACHELOR

B ECONOMETRICS AND DATA SCIENCE

Vrije Universiteit Amsterdam

SUMMARY REPORT

4 November 2023



## 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](http://www.nvao.net). There you can also find more information on NVAO and peer reviews of new programmes.

## 2 Panel

### Peer experts

- Prof. dr. Jan Boone (chair), professor and head of the department Economics, Tilburg University;
- Prof. dr. Filip Van den Bossche, vice dean for education and students at the Faculty of Economics and Business (FEB), KU Leuven;
- Dr. Patty Duijm, economist at Data Science Hub, De Nederlandsche Bank;
- Sven Goessens BSc (student), master student Data Science & Society, Tilburg University.

### Assisting staff

Anne Martens MA (secretary)

Frank Wamelink (NVAO policy advisor and process coordinator)

### Site visit

Amsterdam, 19 September 2023

### 3 Outcome

The NVAO approved panel reaches a positive conclusion regarding the quality of the bachelor's programme Econometrics and Data Science (EDS) offered by Vrije Universiteit Amsterdam. Since September 2017, the programme has been offered as an English-taught track within the bachelor's programme Econometrics and Operations Research (EOR) and the institution now intends to offer this programme of 180 ECTS credits independently in a fulltime variant in Amsterdam. The programme complies with the four standards of the limited NVAO assessment framework.

The programme prepares students for a career in quantitative fields related to, for instance, economics and finance. The combination of econometrics and data science gives the programme a distinctive profile that reflects current developments in academia and addresses the great need for data scientists who understand the underlying mathematics and statistics. External stakeholders are involved in the development of the programme to ensure it stays up to date with recent developments in the industry.

The first two years of the programme offer a broad and thorough foundation in mathematics, statistics, data handling and programming. Students are also given an introduction to ethics, economics and finance. Students work on individual and group assignments to apply what they have learnt, using real data sets. In general, the panel considers the content of the courses to be appropriate, although some data science aspects could be given more attention. The panel was pleased with the programme's plans in this regard. The final year offers students the opportunity to select courses based on their personal interests. Students finish the programme with a thesis.

The course assessments are in line with the intended learning outcomes and enable students to develop and show their knowledge and skills in different ways. The panel studied a selection of exams and theses and established that they fit the programme and demonstrate a bachelor's level. The panel noticed that most theses are related to classical econometric topics and models rather than data science, but expects that it will be easier to motivate students to opt for data science components and models once the EDS track has become an independent programme with a clearer profile.

The panel is positive about the programme's qualified and dedicated staff members. They represent the different disciplines related to data science and have a broad network of (inter)national contacts in the field of econometrics research. Some lecturers also have positions in the professional field. An experienced Examination Board safeguards the quality of assessment procedures in a professional manner.

The panel concludes that EDS offers a relevant and attractive programme that meets the developments in the data science discipline and professional field. The curriculum aligns with the academic bachelor's level and enables students to develop themselves as data scientists who can analyse and tackle problems that involve working with data. Given the international field of data science and job opportunities for graduated students, the panel agrees that EDS should (continue to) be taught in English.

## 4 Commendations

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

1. Advisory Board – The programme actively involves external stakeholders in the development of the programme to keep track of developments.
2. Curriculum – The programme has a balanced and multidisciplinary curriculum with a foundation in mathematics, statistics, data handling and programming. Interested students can further develop their skills in ethics, economics and finance.
3. Assignments – Students work on integrative practical assignments that use real data sets and require students to apply what they have learnt.
4. Staff – The academic staff members are qualified and dedicated to the programme. They represent the different disciplines related to data science and have a broad network of (inter)national contacts in the field of econometrics research. Some lecturers also hold positions in the professional field.
5. Examination Board – An experienced Examination Board safeguards the quality of assessments in a professional manner.

## 5 Recommendations

To further improve the programme, the panel recommends a number of follow-up actions.

1. Ethics – Make the compulsory course on ethics more geared towards data science practice, for instance by discussing real-world cases related to privacy and legal issues.
2. Links to practice – Investigate whether it is possible to incorporate guest lectures and real-life cases earlier in the curriculum, so students get an early view of what data science and the job of a data scientist entail in practice.
3. Active blended learning – Further implement the policy on active blended learning by sharing good practices and using the expertise of the recently launched VU's Centre for Teaching and Learning, which has a taskforce active blended learning.
4. Thesis assessment – Adjust the assessment criteria matrix to the specific profile of the new programme, to provide guidelines to examiners on how to come to a certain score when assessing the bachelor's theses.
5. Programming – Extend the programming pathway to ensure that students develop their skills throughout the entire first year. Explain the setup of this pathway more clearly to students, so they understand the added value of learning three different programming languages.

## 6 What comes next?

NVAO grants initial accreditation to a new programme based on 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.<sup>1</sup>

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.<sup>2</sup>

## 7 Summary in Dutch

Het NVAO-panel oordeelt positief over de kwaliteit van de bacheloropleiding Econometrics and Data Science (EDS) van de Vrije Universiteit Amsterdam. Sinds september 2017 wordt de opleiding aangeboden als Engelstalige specialisatie binnen de bacheloropleiding Econometrics and Operations Research (EOR). De instelling is nu voornemens deze opleiding van 180 ECTS zelfstandig aan te bieden in een voltijdse variant te Amsterdam. De opleiding voldoet aan de vier standaarden van het NVAO-kader voor de beperkte toetsing.

Het programma bereidt studenten voor op een carrière in kwantitatieve vakgebieden zoals economie en financiewezen. De combinatie van econometrie en data science geeft het programma een onderscheidend profiel dat de huidige ontwikkelingen in het vakgebied weerspiegelt en voorziet in de grote behoefte aan data scientists die de onderliggende wiskunde en statistiek begrijpen. Externe stakeholders worden betrokken bij de ontwikkeling van het programma om aangesloten te blijven bij recente ontwikkelingen op de arbeidsmarkt.

De eerste twee jaar van het programma bieden een brede en grondige basis in wiskunde, statistiek, dataverwerking en programmeren. Studenten krijgen ook een introductie in ethiek, economie en financiewezen. Studenten werken aan individuele en groepsopdrachten om het geleerde toe te passen met behulp van echte datasets. Over het algemeen vindt het panel de inhoud van de cursussen passend, hoewel sommige aspecten van data science meer aandacht zouden kunnen krijgen. Het panel was tevreden over de plannen van het programma in dit opzicht en beveelt aan om ook het verplichte ethiekvak meer toe te spitsen op data science. Het laatste jaar biedt studenten de mogelijkheid om vakken te kiezen op basis van hun persoonlijke interesses. Studenten sluiten het programma af met een scriptie.

De toetsing en examinering zijn in lijn met de beoogde leerresultaten en stellen studenten in staat om hun kennis en vaardigheden op verschillende manieren te ontwikkelen en te tonen. Het panel bestudeerde een selectie van tentamens en scripties en stelde vast dat deze passen bij het programma. Studenten tonen aan dat zij het bachelorniveau bereiken. Het panel merkte op dat de meeste scripties betrekking hebben op klassieke econometrische onderwerpen en modellen in plaats van data science, maar verwacht dat het gemakkelijker zal zijn om studenten te motiveren om te kiezen voor data science-onderwerpen en modellen zodra de EDS-specialisatie een zelfstandig programma is geworden met een duidelijker eigen profiel. Het programma zou dit kunnen stimuleren door meer relevante onderwerpen aan te bieden.

Het panel is positief over de gekwalificeerde en toegewijde docenten. Ze vertegenwoordigen de verschillende disciplines die gerelateerd zijn aan data science en hebben een breed netwerk van (inter)nationale contacten op het gebied van econometrisch onderzoek. Sommige docenten

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

<sup>2</sup> <https://vu.nl/en>

zijn ook actief in het werkveld. Een ervaren examencommissie bewaakt de kwaliteit van de beoordelingsprocedures op professionele wijze.

Het panel concludeert dat EDS een relevant en aantrekkelijk programma biedt dat aansluit bij de ontwikkelingen in het data science vakgebied en werkveld. Het curriculum sluit aan bij het academische bachelorniveau en stelt studenten in staat zich te ontwikkelen tot data scientists die problemen gerelateerd aan data kunnen analyseren en oplossen. Vanwege het internationale karakter van het data science vakgebied en de kansen op werk voor afgestudeerde studenten, onderschrijft het panel de keuzen om de opleiding in het Engels aan te bieden.

Meer informatie over de NVAO-werkwijze en de toetsing van nieuwe opleidingen is te vinden op [www.nvao.net](http://www.nvao.net). Voor informatie over de Vrije Universiteit Amsterdam verwijzen we naar de website van de instelling.<sup>3</sup>

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<sup>3</sup> <https://vu.nl/nl>

The summary report was written at the request of NVAO and is the outcome of the peer review of the new programme B Econometrics and Data Science of Vrije Universiteit Amsterdam

Application no: AV-1762



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