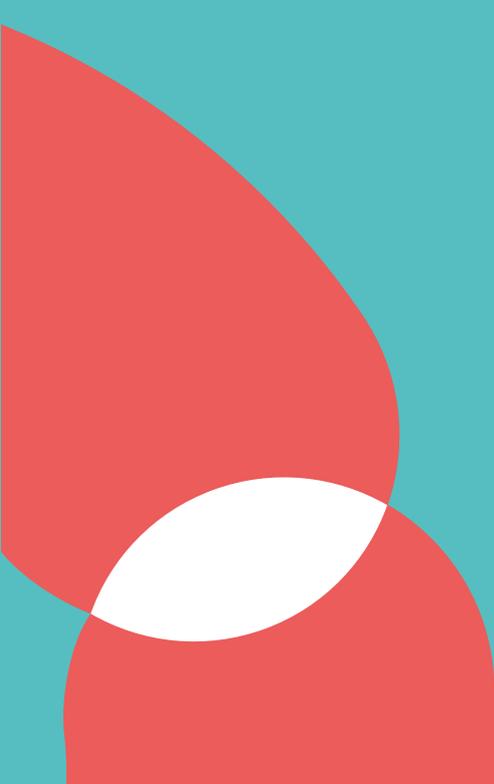




NVAO • THE NETHERLANDS

**INITIAL ACCREDITATION**  
RESPONSIBLE DATA SCIENCE  
Maastricht University

ADVISORY REPORT  
2 DECEMBER 2025



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## 1 Peer Review

The Accreditation Organisation of the Netherlands and Flanders (NVAO) assesses the quality of a new programme through a peer review process. This initial accreditation is mandatory for an institution that seeks to award a recognised degree upon the successful completion of a study programme.

The procedure for accrediting new programmes differs somewhat from that for existing programmes that have already been accredited. Initial accreditation serves as an ex ante assessment of a programme's quality. Once accredited, the new programme becomes subject to the standard review process for existing programmes.

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 these peer experts forms the basis for the panel's final judgement and advisory report. The focus is on the curriculum, the teaching and learning environment, and student assessment. The agenda for the panel visit and the documents reviewed are available from the NVAO office upon request.

The peer review outcome is guided by the standards outlined and published in the NVAO Assessment framework for the higher education accreditation system of the Netherlands (Staatscourant 2024, nr. 6405). Each standard is evaluated on a three-point scale: meets, partially meets, or does not meet the standard. Based on this evaluation, the panel will rate the programme's overall quality as positive, conditionally positive, or negative.

NVAO makes the decision on the programme's quality based on this advisory report. This accreditation decision can be positive, conditionally positive or negative. If the decision is positive, with or without conditions, the institution may proceed to offer the new programme. Graduates of the programme will then be entitled to receive a legally accredited degree.

This report presents the panel's findings, analysis and judgements resulting from the peer review. It also details the commendations and recommendations for follow-up actions. A summary report highlighting the main outcomes of the peer review is also available.

Both the full and summary reports of each peer review are published on NVAO's website [www.nvao.net](http://www.nvao.net). There you can also find more information about NVAO and peer reviews of new programmes.

## 2 New Programme

### 2.1 General data

<b>Institution</b>	Maastricht University
<b>Programme</b>	Responsible Data Science
<b>Variants</b>	Fulltime: Yes. Parttime: No. Dual: No.
<b>Degree</b>	Master of Science
<b>Locations</b>	Maastricht
<b>Study load</b>	120 ECTS <sup>1</sup>

### 2.2 Profile

The proposed master's programme in Responsible Data Science (MSc RDS) is offered by the Department of Advanced Computing Sciences (DACs), part of the Faculty of Science and Engineering (FSE) at Maastricht University. The MSc RDS is an interdisciplinary master's programme in which students learn to design data science and AI models and algorithms while taking into account the legal, ethical, social and environmental implications. RDS graduates strive to create transparent, fair, and accountable data science methods. Their goal is to promote high-quality data and minimise the risk of misuse. During the master's programme, students learn to perform bias analyses and audits, build explainable AI models and develop inclusive testing procedures to prevent algorithms from discriminating against specific groups of users or citizens. In addition, they learn to translate legal and ethical considerations into specific design choices within algorithms and data-driven systems.

### 2.3 Panel

#### Peer experts

1. Prof. dr. ir. Arend Rensink (chair), Professor in Software Modelling, Verification and Transformation, University of Twente;
2. Prof. dr. Mykola Pechenizkiy, Full Professor Chair Data Mining, Department of Mathematics and Computer Science, Eindhoven University of Technology. Adjunct Professor in Data mining for Industrial Applications at the Department of Mathematical Information Technology, University of Jyväskylä
3. Joas van Ham, AI expert lead, Rijks ICT Gilde (part of the Ministry of the Interior and Kingdom Relations)
4. Sanneke Crezee (student member), Bachelor's degree in Public Administration and Organisational Science (completed); Master student in Economics and Governance at Leiden University.

#### Assisting staff

1. Yvet Blom MSc, secretary
2. Dirk van Loon, NVAO process coordinator

#### Site visit

Maastricht, 9 October 2025

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<sup>1</sup> European Credits

### 3 Outcome

The NVAO-approved panel reached a positive conclusion regarding the quality of the full-time master's programme in Responsible Data Science (MSc RDS) at Maastricht University. The two-year programme (120 ECTS) is offered by the Department of Advanced Computing Sciences (DACS), which is part of the Faculty of Science and Engineering (FSE). The MSc RDS prepares students to become academic professionals who can design, develop and analyse data science and AI models while considering legal, ethical, social and environmental implications.

The panel appreciates the close interaction between the master's programme and the professional field in the development of the programme. Representatives from the professional field have actively contributed to the development of the master's programme and remain involved through guest lectures, internships, thesis supervision and the Education Advisory Board. As a result, the programme is closely aligned with current developments in the field of data science and AI. The Intended Learning Outcomes (ILOs) of the programme are clearly formulated and meet the required master's level (NLQF 7). However, the panel recommends clarifying the terms ethical, social and environmental as used in the ILOs. Clarifying these terms would help create a shared understanding among all stakeholders, including future students and external experts.

According to the panel, DACS has developed a unique and well-structured curriculum that combines theory, research, and responsible data science practice. The implementation of Project-Centred Learning (PCL) and the international classroom offers students a realistic and intercultural learning environment. Throughout the programme, students work in small, multidisciplinary teams on challenging projects based on the data science lifecycle. During the projects, students learn to design algorithms and data-science models while continuously reflecting on the legal and ethical implications. The quality of education is ensured by a highly qualified and multidisciplinary team of lecturers.

The assessment and evaluation system is carefully designed, valid and transparent. DACS uses various forms of assessment and clear rubrics for the master's programme. The Board of Examiners plays an active role in quality assurance. The panel also praises the focus on innovation in assessment, including the integration of Generative AI.

All in all, the panel concludes that Maastricht University's MSc Responsible Data Science is a relevant, up-to-date and distinctive programme that fully complies with all standards of the limited TNO framework.

Standard	Judgement
1. Intended learning outcomes	meets the standard
2. Teaching-learning environment	meets the standard
3. Student assessment	meets the standard
<b>Conclusion</b>	<b>Positive</b>

## 4 Commendations

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

1. Engaged professional field – The MSc RDS was developed in close collaboration with companies, government agencies and knowledge institutions. The professional field remains actively involved through guest lectures, internships, thesis supervision and the Education Advisory Board.
2. Interdisciplinary and socially relevant programme – The MSc RDS combines technical, legal, ethical and social perspectives on data science and AI. Students learn to justify technical design choices by taking into account ethical principles, legal frameworks and the societal impact of data-driven technologies.
3. Strong didactic concept – The Project-Centred Learning (PCL) model ties in well with the professional environment of data science. Students work in small, multidisciplinary teams on real-world challenges within an international classroom.
4. Expert and motivated teaching staff – The teaching staff has extensive expertise in data science as well as law, ethics and social sciences. The combination of research and lectures ensures a contemporary and content-rich learning environment.
5. Assessment system and quality assurance – The MSc RDS has a transparent assessment system with clear rubrics and a variety of assessment methods. The Board of Examiners and assessment experts actively monitor validity, reliability and consistency.

## 5 Recommendations

The panel recommends several follow-up actions to improve the programme further. These recommendations do not detract from the positive assessment of the programme's quality.

1. Terminology of Intended Learning Outcomes – Clarify concepts such as “ethical”, “social” and “environmental” in the Intended Learning Outcomes to ensure a clear and shared understanding among all stakeholders, including future students and external experts. This will help prevent ambiguity and enhance consistency in interpretation.
2. Integration of curriculum components – Clarify how the technical, ethical, legal, and societal components are related and integrated throughout the programme. Providing a clear overview of these interconnections will enhance transparency and help students, lecturers, and external stakeholders understand how these dimensions are embedded within the curriculum.
3. Programme coherence – Continue to monitor programme coherence when implementing future curriculum adjustments. This includes maintaining constructive alignment between courses and projects, and safeguarding the interdisciplinary character, particularly in the assessment of projects and theses.
4. Professional scope – Extend the programme's current focus on healthcare and the public sector by providing students with examples from a wider range of data-driven domains.
5. Combined internship and thesis – Clarify the distinct learning objectives of the internship and master's thesis project and provide explicit guidance on the advantages and potential drawbacks of conducting both components within the same organisation. This will help students make well-informed decisions regarding their individual study trajectories.

## 6 Assessment

### 6.1 Standard 1: Intended learning outcomes

*The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.*

#### **Judgement**

Meets the standard.

#### **Findings, analysis and considerations**

The master's programme in Responsible Data Science (MSc RDS) is offered by the Department of Advanced Computing Sciences (DACs), part of the Faculty of Science and Engineering (FSE) at Maastricht University. During the site visit, the panel met with representatives of the faculty and programme management, the teaching staff, and a broad range of stakeholders from the professional field in which MSc RDS graduates may pursue their future careers. These discussions gave the panel a clear understanding of the programme's underlying principles and the formulation of its Intended Learning Outcomes (ILOs).

#### *Intended Learning Outcomes*

The programme prepares professionals to develop algorithms and models for responsible data science, taking into account their legal, ethical, social, and environmental implications. As there is no comparable master's programme in the Netherlands, the development team designed a new framework of ILOs: four clusters with a total of twenty thoughtfully formulated outcomes. The ILOs were developed by an interdisciplinary team of lecturers and researchers representing technical, legal, and social disciplines. During the design phase, extensive consultations took place with students, academics, businesses, and knowledge institutions to ensure that the programme aligns with the needs of prospective students and the professional field.

Like the three other programmes offered by DACs, the programme is based on the KION framework (Kunstmatige Intelligentie Opleidingen Nederland). This framework guarantees the data science and AI components of the programme, with skills such as machine learning, data analysis and algorithmic thinking. In addition, the master's programme uses the TAPS-RM (Transparency, Accountability, Privacy, Societal Responsibility Matrix). The TAPS-RM is a tool that data science projects can use to critically assess the social impact of data use, legal considerations and responsible innovation policy. The programme management explained that it chose the TAPS-RM to cover the "responsible" part of the programme. The ILOs have been refined and validated through a number of channels, including consultations with representatives from the ICT sector and discussions in the DACs Education Advisory Board.

The panel finds the decision to use both frameworks clear and well-founded. A comprehensive ILO matrix provided the panel with valuable insight into the relationship between the ILOs, the Dublin descriptors, and the master's level (NLQF 7). On this basis, the panel concludes that the ILOs meet the required master's level. The panel notes however, that the terms ethical, social, and environmental as used in the ILOs would benefit from further clarification. These concepts were interpreted differently by the various stakeholders consulted during the site visit, including programme management, lecturers, and representatives from the professional field. To ensure a shared understanding among all stakeholders, including current and prospective students, the professional field, and external experts such as an NVAO panel, the panel recommends clarifying the terms used in the ILOs more precisely.

#### *Professional field*

During the site visit, the panel met with representatives from the professional field, several of whom are members of the DACs Education Advisory Board (EAB). The EAB includes representatives from the public and private sectors as well as from knowledge institutions. The Board meets twice a year to discuss developments and trends relevant to DACs and its programmes.

The representatives expressed strong support for the introduction of the MSc RDS. They noted that, in professional practice, many data scientists possess strong technical skills but lack sufficient understanding of legislation, regulation, and the broader social impact of their work. A frequently cited example during

the discussions was the Dutch childcare benefits scandal, in which thousands of citizens who were legitimately receiving benefits were wrongly labelled as fraudulent. This was partly the result of automated fraud-detection algorithms that, because of biased data and decision rules, led to discriminatory outcomes.

According to the representatives, data scientists increasingly collaborate with legal experts and ethicists to incorporate legal and ethical considerations into their algorithms and data-science models. However, significant communication and conceptual gaps between these disciplines remain. As illustrated by the childcare benefits case, such gaps can lead to serious societal consequences. To help bridge these gaps, the EAB actively advocated for the development of the MSc RDS.

The members of the EAB have been closely involved in formulating the ILOs and developing the curriculum. They have indicated that they wish to remain consistently committed to the programme, for example by providing guest lectures, internships and thesis supervision. The panel considers the close and ongoing collaboration between the MSc RDS and the professional field to be a strength of the master's programme. The representatives from the professional field find the collaboration with DACS pleasant and constructive. They are satisfied with how their feedback has been incorporated during the development process of the master's programme. The collaboration has resulted in a programme that is well aligned with the needs of the professional field.

#### *International perspective*

The MSc RDS is an interdisciplinary programme with a clear international orientation. It is closely aligned with global developments in the field of ethical and responsible AI and data science. Throughout the curriculum, particular attention is given to European legislation and regulation in the field of AI, and to how these frameworks shape responsible data use and algorithmic decision-making. The programme is also anchored in regional and international partnerships that connect education, research, and innovation, including Brightlands and the BISS Institute (see Standard 2). Through these partnerships, students have the opportunity to participate in projects that are part of European research networks and innovation programmes. As one of the first programmes in Europe to focus on responsible data science at the master's level, the MSc RDS benefits from Maastricht University's location near the Belgian and German borders. This strategic location offers excellent opportunities for attracting international students and for collaboration with foreign knowledge institutions. Finally, the MSc RDS recently joined the Academic Data Science Alliance (ADSA), an international organisation that supports universities worldwide in developing data science and AI programmes. Through ADSA, the programme management actively follows international trends and integrates relevant developments into the MSc RDS curriculum.

#### *Overall summary*

In summary, the panel concludes that Maastricht University has developed a relevant and distinctive programme with the MSc RDS. The master's programme educates a new type of academically educated professional who can design and develop responsible algorithms and data-science models. Representatives from the professional field emphasised the growing demand for responsible data scientists in practice. They have been actively involved in the development of the programme's ILOs and curriculum and expressed a strong willingness to continued collaboration. The ILOs are clearly formulated and meet the required master's level (NLQF 7). The panel also finds that the programme aligns with international developments as well as with European legislation and regulations concerning responsible data use and ethical AI. Based on these findings, the panel concludes that standard 1 is met.

## 6.2 **Standard 2: Teaching-learning environment**

*The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.*

### **Judgement**

Meets the standard.

### **Findings, analysis and considerations**

The MSc RDS is a two-year programme (120 ECTS) that gradually increases in complexity. It applies the didactic teaching concepts of Project-Centred Learning (PCL) and the international classroom. These concepts place project work and interdisciplinary and intercultural collaboration at the heart of the MSc

RDS. Throughout the programme, students work on research projects in small, multidisciplinary teams. In the projects, students are challenged to design algorithms and data-science models according to the data science lifecycle: business understanding, data collection, data cleaning, data exploration, feature engineering, predictive modelling and data visualisation. When developing these algorithms and models, students are expected to reflect continuously on the potential legal and ethical consequences of their decisions.

### *Curriculum*

The semesters are organised according to the FSE's 7-7-3 week model. The 7-7-3 model means that students follow three periods of education: two periods of seven weeks and one period of three weeks. The two seven-week periods consist of six weeks of lectures, tutorials and practical sessions, followed by exams in the seventh week. The subsequent three-week period is reserved entirely for project work. During the RDS programme, students take a total of eight core courses (each worth 6 ECTS credits), two elective courses (each worth 6 ECTS credits), two Semester Master Research Projects (each worth 6 ECTS credits), an internship (18 ECTS credits) and the Master's thesis (30 ECTS credits). For each course, the MSc RDS has translated the ILOs of the master's programme into a set of learning objectives.

The first year of the master's programme lays a solid theoretical and practical foundation in the field of responsible data science and increases in complexity throughout the year. Students take core courses such as FAIR Data Management, Responsible Machine Learning and Data, Responsible Generative AI, Privacy Preserving Data Technologies and Explainable AI. In addition, they choose one elective course, such as Building and Mining Knowledge Graphs or Network Science. The central component of Year 1 consists of two major research projects (one per semester): Semester Master Research Project 1 and 2. In these two projects, students work on real-world data science challenges. The data lifecycle forms the foundation for the three project phases: the design phase (period 1), in which students develop a research plan; the implementation phase (period 2), focused on data collection, modelling, testing and analysis; and the final phase (period 3), in which students complete and evaluate their responsible data-science model or algorithm. These projects run parallel to the courses within each semester. Students also follow a series of skills courses designed to develop professional data-science competencies, such as scientific writing (using LaTeX), providing and receiving peer feedback, working with software-engineering tools (GitHub, GitLab), conducting interviews, and using the Data Science Research Infrastructure via Jupyter Notebooks.

The second year of the master's programme is a natural continuation of the knowledge and skills acquired in the first year. The second year starts in period 1 with the core course (Mis)Leading with Data and an elective course, such as Data Science in Healthcare, Legal Analytics or Data Science for Social Good. In the same period, students also start their professional or research internship (18 ECTS). The internship takes place at an organisation or research institute of students' choice. Students prepare a written internship plan in consultation with the internship examiner and the internship organisation. The plan is then approved by the Board of Examiners. During the first period of the internship (7 weeks), students focus on preparatory work such as literature research, methodology selection and data analysis. Periods 2 and 3 (10 weeks in total) are dedicated to full-time research. At the end of the semester, students begin preparing for their master's thesis. Students explore potential research themes through discussions with academic staff and by consulting the annually updated list of thesis topics available on the programme's Canvas page.

The final semester is entirely devoted to the master's thesis (30 ECTS), an individual empirical or theoretical research project in the field of responsible data science. The thesis process comprises six structured phases: (1) topic selection and supervisor assignment prior to the second semester; (2) development of a detailed research plan; (3) execution of the research under regular supervision; (4) writing the thesis; (5) preparation for the final presentation; and (6) a public on-site defence at DACS.

Based on the documentation provided, the panel initially found it somewhat unclear how the curriculum balances its technical, legal, ethical, and societal components. During the site visit, these ambiguities were clarified. Lecturers explained that the MSc RDS curriculum differs from traditional data science programmes in that its primary focus is not on designing algorithms and models, but on the ability to justify technical decisions through social and ethical reasoning. The technical courses address the development of models and the algorithms that underpin them, while students are encouraged to reflect

on their social, legal, ethical, and environmental implications. Conversely, the more policy-oriented and ethics-related courses integrate technical components. The panel recommends clarifying how the technical, ethical, legal, and societal components relate to one another and are integrated throughout the programme. Providing a clear overview of how these components are connected will help students, lecturers, and external stakeholders understand how they are embedded within the curriculum.

The panel is pleased to see that the course descriptions are detailed and that there is a clear coherence between the various curricular components. Lecturers regularly update course materials to keep the programme relevant in the rapidly evolving field of data science and AI. They also incorporate current case studies, such as the Dutch childcare benefits scandal, to illustrate the impact of algorithmic bias. The panel appreciates this continuous updating but notes that frequent adjustments require adequate coordination. It therefore recommends that DACS continue to monitor the coherence between courses and projects to safeguard overall curriculum alignment.

Finally, the panel notes that during the interviews, lecturers shared numerous examples of data-science applications in healthcare and the public sector. The panel considers this focus logical given DACS's existing partnerships in these areas, but emphasises the importance of providing students with opportunities to engage with a broader professional context. The panel therefore advises the MSc RDS programme to also expose students to data-driven challenges in other domains.

#### *Didactic concept*

The panel considers Project-Centred Learning and the international classroom to be strong didactic concepts. Through these two concepts, students are introduced into real-world data science challenges that they are likely to encounter after graduation. The PCL concept, derived from the institution-wide Problem-Based Learning (PBL), has been adapted within the MSc RDS to a project-oriented concept that ties in well with the professional context of data and computer scientists. Students work in small, multidisciplinary teams of up to six people on research projects that foster collaboration, critical thinking and solution-oriented learning. The international classroom concept further enriches the learning process by bringing together students from different backgrounds to actively participate, negotiate ideas, and share expertise, moving beyond passive listening to become co-creators of knowledge.

#### *Research*

The MSc RDS is embedded within the strong research environment of DACS, where fundamental research in AI, data science, and responsible algorithmic design are closely interlinked. Students benefit directly from this environment, as lecturers and researchers actively integrate their research into the curriculum and bring current data-science challenges into lectures and projects. The programme also draws on regional and international partnerships, including the Brightlands Campus and the BISS Institute. Brightlands is the umbrella initiative through which Maastricht and the province of Limburg position themselves as a network for innovation. It comprises four campuses where companies, researchers, students, and governments collaborate on pioneering developments in areas such as health, digitalisation, the circular economy, and data science. The BISS Institute, located at the Brightlands Smart Services Campus in Heerlen, connects education, research, and knowledge valorisation in the field of data science and smart services. BISS contributes to the MSc RDS by developing course modules and participating in interdisciplinary projects and research with DACS staff on the ethical, legal, and societal aspects of data science.

According to the programme management and teaching staff, both Brightlands and BISS play an important role in the MSc RDS. However, during the site visit, the panel did not gain a fully clear picture of the specific contributions made by each partner. The panel therefore advises DACS to define more explicitly the respective roles of Brightlands and the BISS Institute within the programme, to avoid potential confusion among current and future students.

#### *English-language programme*

The MSc RDS is taught in English. The panel understands and supports this choice, considering it appropriate for DACS to use English as its primary language of instruction. English is the dominant language in the fields of data science and AI. Teaching in English ensures that students are well prepared for careers in an international environment. The use of English also aligns naturally with the programme's educational concepts, such as Project-Centred Learning (PCL) and the international classroom. In line with

these approaches, students of different nationalities work together in small, project-based groups, developing their intercultural and communication skills. The choice of English is further justified by DACS's many collaborations with international partners within Brightlands and the BISS Institute, and by the fact that the programme content draws on international literature and software, including programming languages, debuggers, integrated development environments (IDEs), and machine learning tools and libraries.

International students who wish to strengthen their position on the Dutch labour market can take Dutch language courses through the UM Language Centre. Dutch-speaking students may write their internship report or master's thesis in Dutch if the context or commissioning organisation requires so.

#### *Intake*

The MSc RDS is scheduled to start in September 2026 with an expected intake of approximately 25 students. Students holding a Dutch bachelor's degree in Artificial Intelligence, Data Science, Applied Mathematics, Computer Science, Operations Research, Econometrics, Applied Physics, or Engineering are directly eligible for admission. Candidates with a different academic background, or those who obtained their bachelor's degree abroad, will be assessed by the Board of Admissions. The Board verifies whether the candidate has a solid foundation in statistics and programming, equivalent to at least 30 ECTS in their bachelor programme.

The master's programme will start annually in September. In the first few years, an increase to around 50 students is anticipated. The programme management has already observed growing interest from students in other faculties, partly due to the popularity of RDS-related minors. Moreover, the management expects that the societal demand for experts in responsible data science will continue to grow rapidly. The MSc RDS has sufficient staff capacity to accommodate up to 100 students without any problems.

#### *Teaching staff*

The panel spoke with a strong, motivated, and multidisciplinary team of teaching staff. The team comprises academics with expertise in computer science and data analytics, law, philosophy, and the social sciences. Most lecturers are affiliated with DACS and are actively engaged in long-term interdisciplinary research projects within the university or with external partners such as Brightlands, BISS, and ICAI. This close connection between research and teaching ensures that the latest developments in the field are directly integrated into the curriculum. Several lecturers come from other faculties and bring in expertise on law, social sciences, and philosophy. They contribute valuable expertise in ethics, law, and the social impact of data-driven technologies. The panel considers the balance between technical and socio-legal expertise within the teaching team to be appropriate. Lecturers generally divide their time equally between teaching and research and are supported, when necessary, by teaching assistants (TAs) and external experts who deliver guest lectures. One of the reasons DACS has actively recruited new staff in recent years is to develop and deliver the proposed MSc RDS. DACS has indicated that it will have sufficient qualified lecturers, even if student intake exceeds the expected 25 students.

#### *Student guidance and provision of information*

The panel appreciates the well-structured system of academic guidance and personal support in the MSc RDS. Students receive intensive supervision during their research projects, internship, and master's thesis. Each Semester Research Project is overseen by two supervisors (examiners) and a project coordinator, who together monitor students' progress, provide feedback, and support collaboration within the project groups. During the internship, students are guided by a daily supervisor at the host organisation or research institute and a supervisor affiliated with the RDS programme. For the master's thesis, students are supervised by a first and second examiner. If the research is conducted outside the university, an external supervisor from the host organisation or research institute is also involved.

Students can contact academic counsellors for support with study-related matters or for developing an individual study plan. They can discuss their study progress with the counsellors, for example in order to choose electives or prepare for their master's thesis. In the event of any personal issues, the counsellors offer guidance and, if necessary, refer students to doctors, psychologists or external support services.

For students with a disability or chronic illness, Maastricht University's central Disability Office (DO) coordinates the required accommodations. After reviewing the student's medical documentation, the DO advises the Board of Examiners and the academic counsellors. Within DACS, students are generally granted 25% extra time for exams and may take exams in a quieter location. Additional arrangements, such as the use of assistive software, are available when needed.

Before the start of the master's programme, students receive a newsletter containing practical information. During the programme, relevant announcements, timetables, and updates are communicated through the university's digital platform, the Student Portal. International students can participate in the UM buddy initiative, known as the International Student Ambassador Programme (ISAP). Through ISAP, new international students are paired with a current UM student who supports them during their first weeks in Maastricht. The buddy helps with practical matters related to housing, studying, and living in the city. ISAP also organises social events that help students integrate smoothly into the university, the city, and Dutch society.

#### *Quality assurance*

The panel is positive about the active involvement of staff and students in quality assurance within DACS. They provide regular input through the faculty's Education Programme Committee (EPC), which will be extended to include both student and staff representatives from the MSc RDS once the programme begins. In addition, lecturers and programme coordinators gather feedback through regular course surveys and so-called "pizza sessions". Pizza sessions are informal meetings where students and staff discuss the programme's strengths and potential areas for improvement. The feedback gathered through surveys and pizza sessions is used to formulate specific actions to continuously improve the quality of the programme.

#### *Overall summary*

In summary, the panel finds that Maastricht University offers a well-designed and robust curriculum with the MSc RDS. The programme has a logical structure in terms of complexity and strikes a good balance between theoretical knowledge and practical application. Teaching is provided by a highly qualified, multidisciplinary team of lecturers with extensive expertise. Most lecturers and researchers are actively involved in long-term research projects, ensuring that the latest developments in the field are reflected in the programme. Their combined expertise adds depth and relevance to the MSc RDS. Student guidance is well organised, with dedicated counsellors offering academic and personal support through various university services. Based on these findings, the panel concludes that standard 2 is met.

### 6.3 **Standard 3: Student assessment**

*The programme has an adequate system of student assessment in place.*

#### **Judgement**

Meets the standard.

#### **Findings, analysis and considerations**

DACS applies the DACS-wide assessment policy to the MSc RDS. This policy is in line with the assessment policy of the FSE and Maastricht University. It provides a clear and concise framework for assessment and grading, outlining the underlying vision, responsibilities, and guidelines for the design, organisation, and implementation of assessments. The policy is further specified in the Teaching and Examination Regulations (OER) and the MSc RDS assessment plan. The quality of assessments and the final master level are monitored by the DACS Board of Examiners (BoE).

#### *Vision on assessment*

The panel considers the MSc RDS to have a strong and well-defined approach to assessment. Four elements form the basis for the vision on assessment. The first element concerns the consistent use of constructive alignment at both the course and programme level. Each year, the consistency between the ILOs, teaching methods and assessment is evaluated by the programme director, course coordinators, the BoE, the Assessment Committee, and the Educational Programme Committee. For each course, lecturers must explicitly demonstrate how the ILOs align with the final qualifications of the master's programme and how the types of assessment ensure the learning objectives are achieved.

The second element involves the use of a mix of formative and summative assessments to both assess the knowledge and skills acquired (summative) and to support and improve the learning process (formative). Assessment of learning (summative assessment) assesses students on their proficiency in the subject matter. Assessment for learning (formative assessment) focuses on feedback and reflection. Throughout the programme, students receive continuous feedback from lecturers and fellow students on their progress in order to encourage students' ongoing development. Assessment as learning focuses on self-reflection and encourages students to monitor their individual learning process and reflect on their individual progress.

The third element concerns the ongoing innovation of assessment practices. DACS actively responds to developments in areas such as generative AI, large language models (LLMs), and legislation. Assessment formats and criteria are reviewed regularly to ensure that they remain valid, relevant, and up to date. In 2024, DACS established the Computing Sciences Education Research Group to explore how AI, data science, and computer science can be used to innovate assessment, teaching, and student engagement.

The fourth element is the active involvement of students. Students are encouraged to use feedback to adjust their learning strategies, making assessment an integral part of learning rather than merely its conclusion.

#### *Assessment system and assessment methods*

The MSc RDS has a coherent assessment system that ensures validity, reliability, and transparency. Each course includes a detailed course assessment plan outlining the learning objectives, teaching methods, and assessment strategies. These plans demonstrate how the various components of the programme are aligned and how assessment contributes to achieving the ILOs.

Assessment methods across the programme are diverse and include written exams, essays, research reports, group assignments, portfolios, presentations, and peer- and self-evaluation. Within the Project-Centred Learning (PCL) approach, clear assessment rubrics and multiple feedback moments from both peers and lecturers help maintain consistent and reliable grading practices.

The programme director reviews each assessment plan for content alignment and consistency. The Assessment Committee monitors the quality and transparency of assessment on behalf of the BoE. In addition, the Education Programme Committee and the BoE periodically analyse course and project evaluations to identify trends and potential improvements in assessment quality.

The panel notes that the interdisciplinary character of the MSc RDS is not assessed through separate assessment criteria, but is instead embedded in the overall design and organisation of the programme. Multidisciplinary project groups and the involvement of lecturers from diverse disciplinary and professional backgrounds ensure that students continuously learn to analyse problems from multiple perspectives. The panel considers this organisational embedding sufficient to safeguard interdisciplinarity, but advises DACS to continue monitoring how the interdisciplinary character is reflected in future curriculum developments and in the assessment of projects and theses.

#### *Master's thesis*

The master's thesis (30 ECTS) is the final component of the MSc RDS and serves as an integrated assessment of the knowledge, skills and research competencies students have acquired during the programme. Students conduct empirical or theoretical research within the field of responsible data science. They may conduct their thesis research at the same company or institute where they completed their internship. Lecturers emphasised, however, that the thesis must not be a continuation of the internship, as both components pursue different learning objectives. While the thesis may be inspired by the internship, it must address new research questions and involve distinct research activities. The panel noted that it is not entirely clear to students what the potential advantages and drawbacks are of combining the internship and thesis within the same organisation. Therefore, the panel recommends that the programme clarify the distinct learning objectives of both components and provide explicit guidance on the different options for combining, or not combining, them. This will help students make well-informed decisions regarding their individual study trajectories.

As discussed in standard 2, the thesis process comprises six structured phases, including the preparation of a detailed thesis plan. This plan is reviewed by the first and second examiners and submitted to the

Assessment Committee for approval. The committee evaluates whether the plan aligns with the final qualifications of the master's programme, justifies the 30 ECTS workload, and whether the proposed supervisors and research context are appropriate.

The thesis process concludes with a public defence at DACS, during which students present and discuss their research. Grading is based on a standardised rubric designed to ensure the validity, transparency, and comparability of results. In addition to assessing the quality of the thesis content, examiners also evaluate the reproducibility of the research, based on the accompanying source code, metadata, and datasets that must be submitted with the thesis.

The two examiners jointly determine the final grade. If the research has been conducted outside Maastricht University, the external supervisor is also consulted in the grading process. All master's theses undergo a plagiarism check, and the BoE periodically conducts cross-checks to ensure consistency in grading across the MSc RDS programme. During these checks, the BoE compares a selection of recently assessed MSc RDS theses with theses from other DACS programmes and, in future, with those from other universities.

#### *Generative AI and assessment*

In line with the university-wide policy of Maastricht University, the FSE has been tasked with designing a faculty-wide framework for dealing with Generative AI (GenAI). DACS recognises that the use of GenAI tools cannot be prevented and therefore seeks to define principles for their responsible use. Course coordinators evaluate potential risks that GenAI poses to the validity and reliability of assessment and, where necessary, implement mitigating measures such as oral examinations, supervised written examinations, or open-ended assignments that require analytical reasoning. At the same time, DACS encourages staff to explore the educational potential of GenAI, supported by professional-development training and workshops.

#### *Quality of assessment*

The BoE is responsible for ensuring the quality of assessment. It monitors the final level of the master's programme, appoints examiners, establishes guidelines and handles exemption requests, among other things. The panel spoke with Board members who have been involved in developing the MSc RDS from an early stage. As a result, they are well informed about the ILOs, the curriculum, and the assessment methods used within the programme. The BoE verifies whether assessments align with the learning objectives of each course and checks their reliability, validity, and transparency. In addition, it periodically analyses assessments and theses on a random basis to identify areas for improvement.

Assessment quality is further supported by faculty experts and the University Centre for Teaching & Learning (EDLAB) who support the continuous improvement of assessment practices across programmes. All lecturers are required to obtain the University Teaching Qualification (UTQ), ensuring a solid foundation in didactics and assessment principles. In addition, the Continuous Professional Development (CPD) programme offers training and workshops on assessment design, thesis and internship supervision, and the integration of Generative AI (GenAI) into teaching and assessment for thesis and internship supervisors. Together, these measures ensure a consistent and high standard of assessment within the programme.

#### *Overall summary*

The panel concludes that the MSc RDS has an adequate assessment policy that ensures the validity and reliability of assessments with clear rubrics, constructive alignment, and a strong quality assurance system. Assessment formats are diverse and well aligned with the programme's objectives. During the site visit, the panel was impressed by the professionalism and thoroughness of the BoE, whose members demonstrated a good understanding of the ILOs, the assessment methods employed, and their role in maintaining quality. Based on these findings, the panel concludes that standard 3 is met.

## 6.4 Advice on extended study load

DACS has submitted a request for an extension of the regular study load for the MSc RDS, as the programme comprises 120 ECTS instead of the standard 60 ECTS for an academic master's programme. The panel has assessed this request based on the Protocol verlenging reguliere studielast (Protocol for the

extension of the regular study load, March 2022). According to this protocol, a request must meet at least one of the following criteria:

- Is the extended study load necessary to achieve the desired level in an international context?
- Is the extended study load necessary to achieve the level required by the professional field?

The panel concludes that the first criterion applies: the extended study load is necessary to achieve the internationally recognised master's level in the interdisciplinary field of responsible data science. To attain this level, students need sufficient depth in both technical and research-oriented components, while simultaneously developing the ability to critically evaluate and justify their technical choices in light of ethical, legal, and social considerations. The panel notes that these combined technical and methodological components, with ethical, legal, and social considerations cannot reasonably be acquired within a study load of 60 ECTS. A study load of 120 ECTS is essential to combine a solid technical foundation with extensive research and a substantial master's thesis. The panel is therefore convinced that the 120-ECTS structure is justified and necessary to achieve the intended master's level and to align with international standards for programmes in the field of data science.

## Abbreviations

ADSA	Academic Data Science Alliance
AI	Artificial Intelligence
BISS	Brightlands Institute for Smart Society
BoE	Board of Examiners
CPD	Continuous Professional Development
DACS	Department of Advanced Computing Sciences
EC	European Credits
EPC	Education Programme Committee
FSE	Faculty of Science and Engineering
GenAI	Generative Artificial Intelligence
ICAI	Innovation Center for Artificial Intelligence
ILOs	Intended Learning Outcomes
LLM	Large Language Model
MSc RDS	Master of Science in Responsible Data Science
NLQF	Netherlands Qualification Framework
NVAO	Nederlands-Vlaamse Accreditatieorganisatie
OER	Teaching and Examination Regulations
PBL	Problem-Based Learning
PCL	Project-Centred Learning
UTQ	University Teaching Qualification

