

PROGRAMME REVIEW

Master in Cybersecurity Management & Data Sovereignty

D4S Consortium

Brussels - December 2024

PROGRAMME REVIEW MASTER IN CYBERSECURITY MANAGEMENT & DATA SOVEREIGNTY

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Preface VLUHR Quality Assurance Board

Dear reader

This assessment report deals with the programme review of the Master in Cybersecurity Management & Data Sovereignty. This programme review was conducted by an independent panel of experts between October and December 2024.

This report is intended for all stakeholders of the programme and provides a snapshot of its quality following the European Approach for Quality Assurance of Joint Programmes. As chair of the VLUHR Quality Assurance Board I hope that the panel's findings, judgements, recommendations and commendations will advance the setting up of the programme. Additionally, this report intends to provide information regarding the quality of the intended programme to a wider audience. For this reason, this report is published on the website of VLUHR QA.

I would like to thank all members of the panel for the time they invested and the dedication they showed carrying out this programme review. At the very same time, this review was only possible because of the commitment of all those involved in the intended programme.

Mia Sas
President VLUHR Quality Assurance Board

Programme review

Introduction

In this report, the panel of the programme review Master in Cybersecurity Management & Data Sovereignty presents its judgements and recommendations regarding the quality of the Master in Cybersecurity Management & Data Sovereignty at the DIGITAL4Security consortium (D4S). For the administrative details of the institutions and the programme involved, see Annex 1.

The programme review was carried out in accordance with the [VLUHR QA manual for the European Approach for Quality Assurance of Joint Programmes \(Brussels, January 2020\)](#).

Panel composition

The proposal of candidate panel members was approved by the VLUHR QA Board on 8 October 2024. The composition of the panel for the Master in Cybersecurity Management & Data Sovereignty was ratified by the VLUHR QA Board on 16 October 2024.

The panel has the following composition:

- Prof. Dr. Valentina Emilia Balas, Full Professor at the Faculty of Engineering, Aurel Vlaicu University of Arad (Romania) - Chair of the panel
- Prof. Dr. Constandinos X. Mavromoustakis, Professor at the Department of Computer Science, University of Nicosia (Cyprus)
- César Fernández González, Co-Founder and Chief Technology Officer, Ewala Cybersecurity Wizards (Spain)
- Irina Duma, PhD Student in Mechanical Engineering at Technical University of Cluj-Napoca (Romania)

A short cv of the panel members is included in Annex 2.

Patrick Van den Bosch, Head of VLUHR QA, acted as project supervisor and secretary of the programme review.

Ştefania-Maria Armaselu acted as observer on behalf of ARACIS, The Romanian Agency for Quality Assurance in Higher Education.

Review process

The European Approach is mainly based on the ESG and on the Qualifications Framework for the European Higher Education Area (QF-EHEA). In addition, the European Approach takes into account the distinctive features of a joint programme and, thus, specifies the 'standard' approach accordingly.

The 9 standards and related substandards for quality assurance of joint programmes in the EHEA are:

1. Eligibility
 - 1.1 Status
 - 1.2 Joint design and delivery
 - 1.3 Cooperation agreement
2. Learning outcomes
 - 2.1 Level
 - 2.2 Disciplinary field
 - 2.3 Achievement

- 2.4 Regulated professions
3. Study programme
 - 3.1 Curriculum
 - 3.2 Credits
 - 3.3 Workload
4. Admission and recognition
 - 4.1 Admission
 - 4.2 Recognition
5. Learning, teaching and assessment
 - 5.1 Learning and teaching
 - 5.2 Assessment
6. Student support
7. Resources
 - 7.1 Staff
 - 7.2 Facilities
8. Transparency and documentation
9. Quality assurance

More detailed information regarding the (sub)standards can be found in the programme report.

Decision rules

The rules set out below are applicable to each standard.

- Compliant: The programme acts in accordance with the standard, and its implementation is effective.
- Partially Compliant: Some aspects or parts of the standard are met while others are not. The interpretation of the standard is correct, but the manner of implementation is not effective enough.
- Non-Compliant: The programme fails to comply with the standard.

Preparation

The request for this review was submitted to VLUHR QA on 10 July 2024. The request was resubmitted with modifications on 20 August 2024. This revised request included an addition of the involved consortium partners as well as a request for the evaluation of micro-credentials. Subsequently, the consortium partners indicated uncertainty about whether or not to include the micro-credentials in the evaluation. On 11 September 2024, during a meeting with VLUHR QA, D4S expressed that they did not wish to have the micro-credentials evaluated.

During the initial contact with the D4S consortium, VLUHR QA was asked to conduct this evaluation according to the European Approach for Quality Assurance of Joint Programmes within a short timeframe, as they aimed to have a published peer review report by the end of December 2024. VLUHR QA agreed, given that a strict timeline would be followed, limiting the timing as foreseen in the VLUHR QA Manual for the European Approach for Quality Assurance of Joint Programmes. However, in various phases of the collaboration, D4S was unable to meet the agreed-upon commitments. The agreed and actual timeline is included as Appendix 5 of the report.

In preparation of the review, the D4S consortium wrote a self-evaluation report. This report had to be written in accordance with the VLUHR QA manual for the European Approach for Quality Assurance of Joint Programmes. VLUHR QA received the self-evaluation report by 17 October 2024. The report did not meet the requirements and was sent back to the consortium with a deadline on 25 October 2024. On 26 October 2024 VLUHR QA received the self-evaluation report and annexes. As this report still contained internal notes, the consortium was given

the opportunity to resubmit the report, which was done the same day. Two attachments were sent later and reached VLUHR QA on 1 November 2024.

The panel received the self-evaluation report (including supporting annexes) three weeks before the site visit. On 12 November 2024 the D4S consortium has send an update with changes made in the SER and annexes. The panel thoroughly studied the self-evaluation report and its annexes, including the update, to prepare for the visit.

Prior to the visit, the panel members attended a training session on 5 and 6 November 2024. During the training, the panel members received more detailed information on the review and the practical details of how the review process takes place. Special attention was given to the status of the programme, quality assurance in the European Higher Education Area (EHEA), the review process and interview techniques. The panel got acquainted with the standards of the European Approach for Quality Assurance of Joint Programmes and was informed about how this framework relates to the European Standards and Guidelines (ESG). The visit schedule was also discussed and is attached in Annex 3. Finally, the self-evaluation report was discussed in depth to prepare the site visit.

Visit

The panel conducted the programme review on 18 and 19 November 2024 at Politehnica University of Bucharest in Bucharest, Romania. During the site visit, the panel spoke with all those involved in the programme in order to gain insight into the quality of the programme, for example the programme managers, students of related programmes, the teachers, the professional field and the persons responsible for quality assurance and student support. Part of the site visit was intended to be dedicated to review the programme-specific infrastructure. In order to give students and staff the opportunity to talk confidentially to the panel there was an open consultation. At the end of the site visit, the panel discussed its findings, judgements, recommendations and commendations with the programme management in a co-creative session. After a final panel meeting, the panel shared its main conclusions with the programme management in an oral report. The interviews provided the panel, in addition to the documents studied (see Annex 4 for an overview), relevant insights regarding the quality of the intended programme.

Report

In the subsequent assessment report the panel provides the findings, judgements, recommendations, and commendations regarding the quality of the programme as a whole. The panel also formulates a conclusion at the end of the report, readable for a broad audience and including an advice for accreditation, as well as a list of commendations and recommendations. The programme management was given the opportunity to respond to the draft of this report before finalisation.

Programme report

Context

The Master in Cybersecurity Management and Data Sovereignty is a 120 ECTS online joint programme that is seeking for initial accreditation. The full-time programme is aimed to be completed over two years across four semesters. The part-time programme would be spread over three years, completed across six semesters.

According to the self-evaluation report (SER), the Master in Cybersecurity Management and Data Sovereignty is designed to deliver an innovative, comprehensive, and sustainable training pathway for the next generation of cybersecurity professionals. The programme aims to set a new benchmark in advanced cybersecurity education, fostering expertise that addresses Europe's critical digital security challenges while ensuring graduates are equipped to lead in an evolving global cybersecurity landscape.

The programme is developed under the "DIGITAL4Security - European Masters Programme in Cybersecurity Management & Data Sovereignty" project. This is spearheaded by the University Politehnica of Bucharest (UPB), in partnership with 36 partners, including 13 academic partners and 23 associate partners. The project is funded by the European Union under the "DIGITAL-2022-SKILLS-03 - Advanced Digital Skills" initiative (project ID 101123430).

The Master in Cybersecurity Management & Data Sovereignty aims to be tailored for a wide range of learners in cybersecurity, from those entering technical fields to current professionals seeking to deepen their expertise. By delivering advanced cybersecurity knowledge and promoting a proactive, analytical mindset, the programme intends to empower participants to excel in this critical field, driving innovation, resilience, and enhanced data protection in their organisations.

The partner institutions intend to organise the governance of the programme through the following bodies:

- The Master's Board of Directors consists of programme directors that have been selected by each of the partner institutions to represent them on all matters concerning the degree programme. The Board shall be responsible for general management, financial supervision, academic supervision, quality assurance, degree awarding and recognition issues, agreement changes, dispute resolution and student complaints, system review, advice on policy developments for the joint degree programme, and to ensure the coherence and consistency of the concept of the programme.
- The secretariat shall have the responsibility for the overall daily operational and administrative management of the programme under the guidance and governance of the Master's Board. The secretariat shall be partly based at the Project Coordinator Institution, to support the coordination and day-to-day management of the programme and its support mechanisms, specifically tasks regarding quality assurance, application, selection and admission, student administration, and mobility coordination. The secretariat shall also include a wider group of programme coordinators. Each partner institution shall designate a representative member to serve on the programme coordinators group.
- The project coordinator is responsible for:
 - Student recruitment, onboarding, and support processes, including the use of digital platforms and supplementary events.
 - Implementing industry certifications and micro-credentials.
 - Establishing an employability programme for students.
 - Facilitating student and lecturer mobility between institutions and companies.
 - Providing resources for faculty training and support.
- The Joint Admissions Board is assisted by the secretariat and functions under the supervision of the Master's Board. The Joint Admissions Board shall be responsible for the selection and admission of all

students to the degree programme. The Joint Admissions Board shall consist of one representative from each partner institution.

- The Examination Board is headed by the Master's Board of Directors. The Examination Board may be supplemented with additional nominees from partner institutions that have expertise in quality assurance and those who are responsible for programme examination administration.
- The Joint Programme Committee acts as advisor to the Master's Board of Directors. It is responsible for the system review and advice on policy developments for the joint degree programme. The Joint Programme Committee is composed of representatives from the secretariat, the programme coordinators, the Master's Board of Directors, and faculty representatives.
- The Quality Enhancement and Curriculum Development Committee, hereinafter the QECD Committee, will be composed of at least one academic faculty member from each partner institution. The QECD Committee prepares and implements on behalf of the Master's Board of Directors quality enhancement and curriculum development and reinforces the jointness of the degree programme adhering to the European Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). The QECD Committee is accountable to the Master's Board. The QECD Committee assists the Joint Programme Committee to evaluate the degree of achievement of learning objectives and the coherence of the programme and ensures that there are effective procedures for data collection, information analysis and proposals and the channelling of suggestions for improvement of the degree programme.
- Ad hoc committees, when required.

The programme expects to enrol 2500 students by 2026. If 2500 students enrol simultaneously, the student-to-teacher ratio is estimated between 27:1 and 54:1. Each course module has an average of 4 teaching staff members (1 lead teacher + 3 assistants), totalling 92 faculty members (23x4) and resulting in a ratio of ~27:1. If every lecturer teaches two modules, this would equate to 46 unique faculty members, yielding a ratio of ~54:1.

Standards

1 Eligibility

The panel assesses standard 1 as non-compliant.

1.1 Status

“The institutions that offer a joint programme should be recognized as higher education institutions by the relevant authorities of their countries. Their respective national legal frameworks should enable them to participate in the joint programme and, if applicable, to award a joint degree. The institutions awarding the degree(s) should ensure that the degree(s) belong to the higher education degree systems of the countries in which they are based.”

The panel assesses substandard 1.1 as non-compliant.

In accordance with the accreditation application, the programme is offered by Politehnica University of Bucharest, German University of Digital Science, National College of Ireland, Munster Technological University, University of Brescia, Brno University of Technology, University of Rijeka, Polytechnic University of Milan, International University of Rioja, Vytautas Magnus University, Mykolas Romeris University, Cergy Paris University, and the University of Koblenz-Landau.

The Self-Evaluation Report (SER) indicates a division of partners into categories. This concerns degree-awarding institutions, officially listed on the degree document, and contributing partner institutions, not listed on the degree document but included in the Diploma Supplement. The SER claims that the National College of Ireland, German University of Digital Science, University of Rijeka, University of Koblenz-Landau, International University

of Rioja, and Munster Technological University are the degree-awarding institutions. Politehnica University of Bucharest, University of Brescia, Polytechnic University of Milan, Mykolas Romeris University, Brno University of Technology, and Vytautas Magnus University are contributing institutions. Cergy Paris University has withdrawn from this list.

A week before the site visit, the panel received a document outlining changes made to the SER. This revealed that 'Cergy Paris University' is still a contributing partner. Additionally, it became apparent from this update that the National College of Ireland (NCI) is a contributing partner rather than a degree-awarding partner. During the site visit, the panel asked the programme management why these changes were made. According to the programme management, this was an oversight in the SER. As a result, the panel questions the collective ownership and reliability of the SER (see Standard 9). The panel recommends that the consortium should ensure efficient communication between the partner institutions, which aims to ensure effective cooperation and the avoidance of technical errors that might have administrative consequences, such as those related to forgetting one partner in the SER.

The programme management explained that this division of roles is intended to comply with the Grant Agreement of the Digital4Security consortium and the varying national regulations. The programme management argues that higher education institutions (HEIs) in countries unable to accredit the programme nationally will participate as contributing partners, while those in countries permitting fully online education will function as degree-awarding institutions.

The panel was informed that some countries permit online education but impose additional requirements. The SER and discussions during the on-site meeting on legal recognition informed the panel about these. As an example: The panel is informed that Lithuania requires a small portion of a master's programmes to include on-site learning while remaining largely flexible regarding online formats. Romania traditionally does not permit fully online programmes and requires that other nations involved in the joint degree comply with the ESG and that institutions are accredited by a quality assurance agency listed in the European Quality Assurance Register (EQAR). This is not yet the case in the Czech Republic. The latter is currently unable to accredit international online programmes.

Working with two types of institutions could, according to the panel, potentially create confusion among prospective students and other stakeholders. Students may find themselves enrolling in a programme co-delivered by a university in their home country, only to discover that the degree is not recognised in that country. The panel believes this situation could lead to legal issues. The panel recommends that the joint programme should be jointly offered by those institutions that are recognised as HEIs in their countries.

The German University of Digital Science (UDS) is not recognised as a higher education institution by the relevant authorities in Germany. UDS is currently undergoing a review to obtain accreditation by the German Accreditation Council (GAR). The Self-Evaluation Report (SER) states that final approval can be expected by early December 2024. During the meeting with the programme management, the panel learned that UDS is undergoing an external accreditation procedure conducted by ASIIN, an EQAR registered QA agency and did not receive yet approval by the German Scientific Council. In the meeting with the programme management, the representative of UDS indicated first that UDS is already recognised. After further investigations by the panel, the representative of UDS stated that there will be no doubt that UDS will be recognised. Therefore, the panel asked for further clarification regarding the status of the accreditation process: proof of accreditation of UDS by the German Accreditation Council, proof of allowance of UDS by the German Scientific Council and a link to the published UDS accreditation report of the evaluation by ASIIN. Following this, the panel only received the report of the German Scientific Council, without an indication of a decision. The panel did not receive other documents that were mentioned by UDS in the meeting with the programme management. The panel therefore concludes that UDS is currently not a recognised university. The claims made that cannot subsequently be substantiated by documents lead the panel to conclude that it cannot express confidence in the future recognition of UDS as a university, and thus is the programme non-compliant.

The panel recommends therefore that the list of degree-awarding institutions should only be comprised of those recognised as HEIs in their countries.

1.2 Joint design and delivery

“The joint programme should be offered jointly, involving all cooperating institutions in the design and delivery of the programme.”

The panel assesses substandard 1.2 as partially compliant.

The governance of the programme is composed of seven bodies (see: context). These are described in the supporting documents, including the draft cooperation agreement. Most of these bodies are composed of representatives from the 13 higher education institution (HEIs) involved, regardless of whether they are degree-awarding or contributing institutions.

Prior to the design of the curriculum, one of the work packages within the European project supporting the D4S consortium examined the needs for establishing a master’s programme. This involved collaboration between consortium members and representatives from the professional field associated with the D4S project, which are companies in the field of cybersecurity and data sovereignty.

According to the meetings held during the on-site visit, the panel learned that the process of designing the curriculum consisted of proposing a number of modules by each of the 13 partner institutions based on their competencies, sketching the module content based on a draft of learning outcomes. These modules were further discussed by the consortium members based on a research on the labour market needs. Then there were interactive face-to-face meetings to align the content (creation, review, alignment) and afterwards they were subject to the approval of the governing bodies. Students and recent alumni of related master’s programmes in cybersecurity were not consulted. The panel believes they could have further contributed to the development of a high-quality programme (see also Standard 9).

Meetings of the panel with the programme management, teaching staff, and the representatives of the professional field thus reveal that a thorough reflection on the programme’s content has taken place. The panel finds the goal of creating a programme in collaboration with various higher education institutions and industry partners ambitious and commendable. The panel has profound respect for this initiative. The panel believes this exercise done with relevant stakeholder from the professional field ensures the programme clearly has potential added value in the market. It is evident that the needs in the field of cybersecurity have been well identified.

The programme includes both mandatory and elective courses (see Standard 3). While it is unlikely that students will take a course from all thirteen involved HEIs, the panel does not see this as an issue. It is also possible for students to complete the programme without taking courses at all of the degree-awarding institutions. While this is less common, it does not necessarily pose a problem. During the site visit, the programme managers from all institutions involved indicated that they do not see this as a concern due to mutual trust among the partners.

However, the SER also indicates that companies (without educational authority) would be solely responsible for delivering courses. The panel addressed this issue during the site visit. The programme management responded that this was also a mistake in the SER and that these companies are not course leaders, but rather operate under the responsibility of one of the HEIs. The panel further investigated this claim using the provided annexes, but found that companies are consistently listed as course leads in these documents.

The panel requested further explanation from the programme management and was informed that one company is run by a professor who intends to eventually participate on behalf of their university (which is not part of the consortium) but is currently operating under the supervision of an existing consortium partner. The lack of a conclusive explanation and the contradictions in the documents leave the panel unable to rule out the possibility that companies, without being part of the programme’s governance, are responsible for delivering courses.

1.3 Cooperation agreement

“The terms and conditions of the joint programme should be laid down in a cooperation agreement. The agreement should in particular cover the following issues: Denomination of the degree awarded in the programme; Coordination and responsibilities of the partners involved regarding management and financial organization; Admission and selection procedures for students; Mobility of students and teachers; Examination regulations, student assessment methods, recognition of credits and degree awarding procedures in the consortium.”

The panel assesses substandard 1.3 as non-compliant.

The panel received a draft of the cooperation agreement as annex to the SER. On 12 November the panel received an additional document indicating that changes have been made to the cooperation agreement. One of these changes involved a shift in project coordination:

“In the early implementation phase, programme coordination is led by Politehnica University of Bucharest (UPB) for the EU-funded project, with German UDS as implementation lead post-accreditation. German UDS will function as interim lead, working closely with UPB and the consortium to enable rollout from a country that can support a fully online master’s program. Following this, an independent legal entity shall be established to ensure the program’s sustainable continuation post EU-funding.”

The panel noted that the cooperation agreement itself does not specify which institutions are degree-awarding and which are contributing institutions. However, this information can be found in one of the annexes to the cooperation agreement: the *Sample Degree Certificate*. The panel finds it remarkable that this crucial information is not included in the cooperation agreement itself, as it forms an essential basis for defining the legal responsibilities within the partnership.

Additionally, the panel observed that the cooperation agreement consists mainly of general principles, with limited concrete details. Some information that should be included in a cooperation agreement is absent. For example, the way student support is organised is currently only conceptual, representing a preliminary idea of what the programme aims to achieve. There is no clear delineation of roles and responsibilities, which should have been an integral part of the cooperation agreement (see Standard 6). Similarly, the financial aspects of the programme are not addressed in the cooperation agreement. There is also no determination of who will bear responsibility—whether academic, practical, or financial—for the development and maintenance of the planned online learning platform.

The draft consortium agreement rightly states that any institution committing to this programme must ensure sufficient and qualified staff. However, given that the programme leaders have stated their aim to enroll 2,500 students by 2026 and have even mentioned long-term goals of reaching 10,000 students per cohort, the panel questions whether all university leaders involved fully understand the implications of the D4S consortium’s ambitions. The massive recruitment of staff required for this programme would be significant. Additionally, the decision to allow students to complete the programme without taking courses at all degree-awarding institutions must be consciously supported by the governing bodies of all participating universities.

For these reasons, the panel asked the programme management during the site visit to provide the signed cooperation agreement. The panel received the cooperation agreement with UDS’s signature. The panel was informed that the document is currently being circulated among partner institutions for signatures. However, during a closing discussion with the programme management at the site visit, a member of the programme management stated that the document was still under review by the legal departments of the partner institutions before it could be signed. As a result, it is unclear to the panel why it received a version with UDS’s signature during the visit. The panel notes that signatures carry legal implications. The panel concludes that currently there is no final and signed cooperation agreement.

2 Learning outcomes

The panel assesses standard 2 as non-compliant.

2.1 Level

“The intended learning outcomes should align with the corresponding level of the Framework for Qualifications in the European Higher Education Area (FQ-EHEA), as well as the applicable national qualifications framework(s).”

The panel assesses substandard 2.1 as non-compliant.

The programme has a set of eight intended learning outcomes. These learning outcomes are the result of a multi-phase, comprehensive development process. The panel learned from the programme management, teachers, and stakeholders from the professional field that these outcomes are based on a rigorous market needs analysis aimed at identifying the existing and emerging cybersecurity skills critical for companies.

Using a combination of desk research, surveys, and interviews facilitated by industry partners, the consortium identified the required skill sets and formulated relevant occupational profiles based on the European Cybersecurity Skills Framework (ECSF). While the panel reviewed this framework, it noted that the ECSF does not necessarily operate at Level 7 of the European Qualifications Framework (EQF).

The SER states that the intended learning outcomes are aligned with Level 7 of the EQF. However, from the panel’s analysis of the SER and discussions with consortium representatives, it was confirmed by the programme management that they had not conducted an analysis of national qualification frameworks. As a result, the programme has not demonstrated that it is suited to the higher education systems of each partner country, increasing the risk of misalignment and challenges in organising the programme across different systems and is thus non-compliant.

The panel recommends conducting an analysis of the national qualifications framework for master’s degrees together with adjustment (where necessary) to the programme design, in order to fit all the involved higher education systems.

2.2 Disciplinary field

“The intended learning outcomes should comprise competences in the respective disciplinary field(s).”

The panel assesses substandard 2.2 as compliant.

As mentioned above (see 2.1), the D4S consortium conducted a rigorous market needs analysis to identify existing and emerging cybersecurity skills critical for companies. Additionally, the European Cybersecurity Skills Framework (ECSF) was utilised. The consortium reviewed the collected data and established overarching learning outcomes for students completing the programme. As previously noted by the panel (see Standard 1), the panel believes that the preparatory exercise of developing learning outcomes with a broad group of academic experts and professional field representatives adds significant value.

The project within which the D4S consortium prepared this master’s programme includes twenty-two associate partners from countries both within and outside the consortium. These include, among others: Digital Technology Skills Limited (Ireland), Adecco Formazione SRL (Italy), Ataya & Partners (Belgium), Schuman Associaties SCRL (Belgium), Profil Klett (Croatia), and Banco Santander (Spain).

The panel noted that the programme is not included in a disciplinary field according to ISCED and recommends ensuring that the disciplinary field is aligned with ISCED, as well as comparable to similar disciplinary fields in the countries of the partner institutions, in order to ensure transnational comparability and compatibility.

2.3 Achievement

“The programme should be able to demonstrate that the intended learning outcomes are achieved.”

The panel assesses substandard 2.3 as partially compliant.

As the programme review is an initial accreditation, it cannot be formally checked whether the learning outcomes have actually been achieved. The panel therefore assesses this substandard on the basis of its potential.

The module contents are described in a Module Handbook (annex to the SER), containing each the objectives/intended learning outcomes, content, workload, student assessment methods and requirements, together with the overview of the intended learning outcomes' contribution per each module. Based on this document, the programme design demonstrates that the learning outcomes can be achieved. However, without a functional common platform for the organisation of the programme, the panel could not certainly state that the information presented in the SER can efficiently be reached by students and create compliance (see Standards 6 and 7). This because the platform is a core element on which the online programme will function.

The programme intends to conduct surveys after completing the courses. The panel suggests that more rigorously can be checked if the intended outcomes will be achieved.

2.4 Regulated professions

“If relevant for the specific joint programme, the minimum agreed training conditions specified in the European Union Directive 2005/36/ EC, or relevant common trainings frameworks established under the Directive, should be taken into account.”

The minimum agreed training conditions specified in the European Union Directive 2005/36/EC, or relevant common trainings frameworks established under the Directive, are not relevant to this programme.

3 Study programme

The panel assesses standard 3 as partially compliant.

3.1 Curriculum

“The structure and content of the curriculum should be fit to enable the students to achieve the intended learning outcomes.”

The panel assesses substandard 3.1 as compliant.

The programme is aimed to be delivered entirely online through synchronous and asynchronous methods. The programme intends to provide flexibility without requiring physical attendance. Each partner university commits to contribute specialised expertise by serving as module owners within the curriculum.

Although mobility is primarily virtual in this programme, according to the SER, learners will have the option to attend physical networking events, hackathons, and collaborative activities hosted by partner institutions across Europe. This hybrid approach fosters international engagement while maintaining the accessibility and adaptability of an online format.

The programme is structured to encompass a total of 23 modules, balancing both mandatory and elective options to accommodate individual learning paths. Out of these 23 modules, 9 are mandatory, aiming that all students acquire foundational knowledge and essential skills across core areas of cybersecurity. The remaining 14 are elective modules, providing flexibility for students to specialise in areas aligned with distinct occupational profiles. This modular approach intends to support students in tailoring their educational experience to meet specific career goals while addressing emerging cybersecurity challenges across industries.

Based on the market analysis conducted in collaboration with industry partners, several job profiles have been identified and corresponding curricula have been developed to ensure professional preparation. A final poll among all HEIs in the consortium confirmed the inclusion of eight tracks in the master's programme:

1. **Chief Information Security Officer (CISO)** - Focused on strategic leadership and management of an organization's cybersecurity approach.
2. **Cyber Legal, Policy, and Compliance Officer** - Concentrating on the legal and regulatory aspects of cybersecurity, ensuring compliance with relevant laws and policies.
3. **Cybersecurity Risk Manager** - Dedicated to identifying, assessing, and mitigating risks to information security.
4. **Cyber Threat Intelligence Specialist** - Specialising in gathering and analyzing threat intelligence to inform defensive strategies.
5. **Cybersecurity Educator** - Aiming to teach and promote cybersecurity awareness and best practices within organizations.
6. **Cybersecurity Auditor** - Focused on evaluating and improving an organization's cybersecurity policies, practices, and controls.
7. **Digital Forensics Investigator** - Specializing in the recovery and investigation of material found in digital devices, particularly relating to cybercrimes.
8. **Incident Responder** - Concentrating on managing and responding to cybersecurity incidents to minimize damage and recover operations effectively.

The panel examined the curriculum thoroughly. The ECTS files are clear. The structure of the programme enables students to demonstrate the learning outcomes. As the modules operate alongside one another and are offered by different institutions, it is important to ensure that the programme forms a cohesive structure, avoiding overlap. On paper, this seems well-organised, but the panel suggests that the programme should continue to monitor this aspect once it is implemented. The programme's goal is to have each course evaluated annually by two industry professionals (see Standard 9). Therefore, the panel recommends that close attention must be paid to ensure that annual content changes do not affect the programme's coherence.

During the site visit, the panel spoke with students from various countries within the consortium who are pursuing studies in cybersecurity. The panel provided context to the students about the structure of this master's programme envisioned by the consortium. The students present, particularly those interested in the management aspects of cybersecurity, indicated that this programme has an appealing profile with potentially relevant courses. The majority of the students stated that, for them, the content takes precedence over whether or not this master's programme would be officially recognised in their country. However, some students mentioned that obtaining this degree, especially if it is recognised as a master's, could be beneficial for career promotions.

Alongside the overall programme learning outcomes, each course module is aligned with course specific learning outcomes. This structured approach ensures that each module not only aligns with the broader objectives of the programme, but also offers specialized abilities pertinent to specific areas of cybersecurity.

The panel learned that the elective modules that are offered in any given semester, may be restricted due to operational scheduling constraints and/or the overall learner demand for choosing particular elective modules. The panel learned that the programme team will endeavour to accommodate the broadest offering of elective modules each semester under these constraints. The panel points out that the programme has to ensure in all circumstances that the students can achieve the learning objectives set by the programme.

3.2 Credits

“The European Credit Transfer System (ECTS) should be applied properly and the distribution of credits should be clear.”

The panel assesses substandard 3.2 as compliant.

Based on the SER and all relevant documents, the panel concludes that all consortium partners apply ECTS. The panel notes that the ECTS system is applied properly in all documents. The programme’s module handbook gives a clear overview of the ECTS distribution.

3.3 Workload

“A joint bachelor programme will typically amount to a total student workload of 180-240 ECTS-credits; a joint master programme will typically amount to 90-120 ECTS-credits and should not be less than 60 ECTS-credits at second cycle level (credit ranges according to the FQ-EHEA); for joint doctorates there is no credit range specified. The workload and the average time to complete the programme should be monitored.”

The panel assesses substandard 3.3 as partially compliant.

The programme is a 120 ECTS credits programme. One ECTS credit is equal to 25-30 hours of study. Based on the SER and the meeting with the programme management, the panel notes that the programme curriculum has a workload that is evenly distributed across semesters. The panel learned that before each semester begins, the Joint Programme Committee intends to set the timetable and class schedule. Assignment release and submission dates will be determined in advance to ensure a fair and balanced distribution of assessment workload for learners.

Each semester includes 12 weeks of teaching, followed by time allocated for exams. In the full-time programme, students can earn 30 ECTS per semester over four semesters, with a workload of approximately 750 hours per semester. This workload includes both attendance-based learning and self-study of all compulsory elements, with detailed workload estimates available for each module. The part-time programme schedules 20 ECTS per semester, corresponding to around 500 hours of work. Each course module typically corresponds to 5 or 10 ECTS.

The programme is designed with a flexible curriculum structure that accommodates both part-time and full-time online master’s students. The full-time programme is to be completed over two years across four semesters. The part-time programme is spread over three years, completed across six semesters.

The SER stipulates that for the full-time and part-time programme, other work formats can be used. This is because the part-time programme is expected to be followed mainly by persons combining studies and a job. This is a common approach in programmes in the European Higher Education Area. However, during the interview with the teaching staff, the panel also learned that in the part-time programme it would be possible to spend less time for courses, given the busy combination of work and study. The panel strongly states that this cannot be done given the customary 1 ECTS credit is generally equivalent to 25-30 hours of total workload. The programme itself indicates that it assumes that one ECTS represents 25 hours of workload. Further reducing the working hours would no longer align with the intended ECTS. A more limited effort for the same diploma is inconsistent with the ECTS. The panel recommends ensuring that the part-time track respects the time per ECTS.

Therefore, the panel is happy to learn that, as part of internal quality management, student feedback will be collected after each semester, including questions on actual workload experienced per module. This feedback would allow adjustments, should any discrepancies be found towards the module’s ECTS credits and expected workload. Additionally, student support services are available to assist learners in case they experience any challenges related to workload.

4 Admission and recognition

The panel assesses standard 4 as partially compliant.

4.1 Admission

“The admission requirements and selection procedures should be appropriate in light of the programme’s level and discipline.”

The panel assesses substandard 4.1 as partially compliant.

The admissions process must be regulated in a cooperation agreement. This agreement is limited to a few general principles, including which governance bodies are involved in admissions. The Self-Evaluation Report (SER) provides additional information about the programme's intentions regarding the admission of students.

The Joint Admissions Board, composed of representatives from all academic partners, is responsible for setting standards, managing the selection process, and ensuring a fair and consistent evaluation of all applicants. The Master's Board of Directors provides strategic guidance and final approval of admissions decisions, supported by the secretariat. During the site visit, the panel learned that it is still unclear who will take on the role of the secretariat.

Based on the SER and supplementary discussions with the programme management, the panel was informed that application deadlines will be published on the webpage www.digital4security.eu. Applications are to be submitted via a designated online application portal, which the programme will develop. This portal is expected to provide detailed instructions to guide applicants through the process.

According to the SER, the admission process involves submitting an application form, academic transcripts, two letters of recommendation, and a personal statement outlining the applicant's motivation and career goals. Shortlisted candidates may be invited for interviews to further assess their suitability for the programme. The selection process, as stated in the SER, involves multiple committee members independently reviewing each application to ensure a comprehensive and unbiased evaluation. The admission requirements also include English proficiency proven by internationally recognised tests (IELTS, TOEFL and CEF).

The SER outlines that applicants must hold at least an EQF Level 6 qualification, such as a bachelor's degree in a relevant field like Computer Science, Information Technology, Cybersecurity, or equivalent disciplines. Degrees in related fields, such as Engineering, Mathematics, or Data Science, may also be considered; in such cases, the selection committee evaluates the curriculum content for relevance.

The SER also indicates that the programme is inclusive and considers applicants without formal qualifications if they can demonstrate relevant skills and knowledge through professional experience, portfolios, or certifications like CompTIA Security+, CCNA, or advanced professional Microsoft certificates. These applicants are required to submit evidence, such as work samples and detailed CVs, which will be evaluated against the established criteria by the Joint Admissions Board. During discussions with the programme management, the panel requested clarification on this matter, as—except for exceptional cases—an EQF Level 6 qualification is typically required to enroll in a master's programme. The programme management denied the inclusion of this provision in the SER and stated that it only applies to students who are completing their bachelor's degree and do not yet have their diploma at the time of application. The panel believes that this explanation aligns with standard admissions procedures for international joint programmes. However, the panel observes that this explanation contradicts the statements in the SER. Therefore, the panel recommends the programme to clarify the admissions criteria to avoid the risk of awarding master's degrees to students who do not meet the legal requirements.

The discussions held during the site visit revealed that the consortium aims for a total number of 2,500 students admitted until 2026, but a separation between part-time and full-time master students, and learners (who would attend a part of the modules for professional certification) is not set.

Given that the panel observes the cooperation agreement provides only minimal information regarding admissions and that the admissions criteria outlined in the SER were contradicted during the site visit, the panel concludes

that they lack confidence in the admissions criteria's compliance with relevant legal requirements and their solid implementation. Due to the absence of a ready-to-launch online collaborative platform, it was not possible for the review panel to assess whether the technical aspects of the admission would be fit to the programme objectives (see Standard 5).

4.2 Recognition

“Recognition of qualifications and of periods of studies (including recognition of prior learning) should be applied in line with the Lisbon Recognition Convention and subsidiary documents.”

The panel assesses substandard 4.2 as partially compliant.

The programme's consortium agreement gives no reference to the Lisbon Recognition Convention. The SER refers to the programme's Recognition of Prior Learning policy in the cooperation agreement. This is however limited to one sentence stating that: “Each Partner Institution formally recognises the modules offered within the joint degree programme and the credits awarded.”

The SER clarifies that the Joint Admissions Board will evaluate the applicants' numeracy skills based on the evidence provided, typically considering prior completion of modules with significant numerical content. If evidence of sufficient numeracy skills is lacking, applicants may be required to complete an assessment. Assessors will consider whether the learning gained from experience aligns with the programme content, applying criteria such as the balance between theory and practice, the transferability of learning, and whether the applicant has achieved an appropriate academic level, specifically meeting EQF level 6 qualifications for admission.

The panel recommends specifying the recognition policy in the cooperation agreement and to ensure that the policy is aligned with the local eligibility requirements for admission of the partner universities.

5 Learning, teaching and assessment

The panel assesses standard 5 as partially compliant.

5.1 Learning and teaching

“The programme should be designed to correspond with the intended learning outcomes, and the learning and teaching approaches applied should be adequate to achieve those. The diversity of students and their needs should be respected and attended to, especially in view of potential different cultural backgrounds of the students.”

The panel assesses substandard 5.1 as partially compliant.

The D4S consortium developed a 'Module Handbook'. According to this Module Handbook, the learning and teaching approaches consist of lectures, tutorials, problem-based learning, practical work, flipped classrooms, seminars, case studies, project work, as well as collaborative group activities and game-based learning. Asynchronous tasks, such as audio/video presentations and practical exercises, should complement synchronous live lectures and labs, allowing students to engage with materials both independently and collaboratively. In the discussions held during the site visit, it was mentioned that associate partners may also propose case study activities based on the real cases encountered in the labour market. The panel's view is that these learning and teaching approaches correspond with the intended learning outcomes.

The panel learned that the programme has chosen Moodle as the Learning Management System (LMS). The programme management informed the panel that it facilitates both asynchronous and synchronous learning activities and includes tools for discussion forums, quizzes, multimedia content delivery, assignments, and real-time communication. Moodle's features are supposed to promote collaboration among students, faculty, and industry partners. The panel learned from its meeting with the programme management that both the Customer Relationship Management system (CRM) and LMS will be hosted on secure, scalable cloud infrastructure. This setup will be designed to ensure high performance, security, and accessibility for all users, allowing participants and faculty to reliably access programme resources from anywhere. The programme intends to also include

integrated lab services to support hands-on learning, providing environments for collaborative coding, private code repositories, and Continuous Integration/Continuous Deployment (CI/CD) workflows. This complements theoretical knowledge with practical skills development. As mentioned in standard 3, in the full-time and part-time programme, other work formats can be used.

Students are required to upload their asynchronously produced work to the Learning Management System (LMS) on a weekly basis. The synchronous class sessions will be designed to build on and enhance these asynchronous and self-paced materials on Moodle. This structure enables learners to engage with the content outside of class, allowing class sessions to concentrate on the practical facilitation and application of the covered materials.

An important aspect of a master's programme is the master's thesis. This master's thesis is coordinated by the partner Universität Koblenz and comprises 10 ECTS. The panel learned during its conversation with teaching staff that students either do an internship or a master's thesis as a dissertation. The panel wanted to know in what way the Universität Koblenz can guarantee qualitative guidance and fair assessment for 2,500 targeted students. To this end, the panel asked for a manual for this course module. This manual sets out some general requirements. The panel indicates that this document gives a brief but clear picture of the general expectations. However, the document contains no further information on how students will be supervised in concrete terms in case external partners are involved, what responsibilities a supervisor has during an internship, what expectations there are regarding the duration of an internship, how a jury for the master's thesis is composed. Additionally it is not indicated how other partners in the consortium might be involved. In addition, it remains unclear to the panel how, in this course module, an intended fortnightly feedback, via the platform or in conversation, can be provided to students should 2,500 students participate in the programme. This leads the panel to conclude that the current manual is too much of a theoretical thinking exercise, without addressing the specificity of this intended master's programme which proves that the programme is not yet compliant.

The panel therefore recommends thinking more thoroughly about the design of the dissertation. The panel recommends that, since this dissertation is a core module of 10 ECTS, it is essential that it be elaborated more thoroughly according to the specific needs of this programme.

The capacity of the fully online programme to respond to the diversity of students and their needs, should have been proven by the functionalities of the online learning platform, which was still in the developing phase by the time of the site visit (see Standards 6 and 7).

5.2 Assessment

“The examination regulations and the assessment of the achieved learning outcomes should correspond with the intended learning outcomes. They should be applied consistently among partner institutions.”

The panel assesses substandard 5.2 as partially compliant.

The assessment of students for each module is described in the Module Handbook, together with the share of each assessed activity in the final grade. In order to enable progress tracking, each module will be equipped with quiz functions, having the aim of identifying the level of each student during the semester, as well as possible challenges in completing the respective module, thus enabling teachers to take corrective measures timely.

All modules intend to incorporate formative assessments through individual or group activities to gauge learning progress, with practical lab work completed weekly during mentoring and tutoring hours. Each module will include one or two additional assessments, which may consist of open book examinations, peer reviews or individual and team projects. Examinations and assessments adhere to the policies still to be established by the Board of Directors, with joint Examination Regulations agreed upon by all partner institutions. The Examinations Board intends to ensure compliance with these regulations. To date, these regulations have only been developed to a limited extent. The panel notes that more specific rules and agreements are needed. At present, it is not clear from the provisions in the cooperation agreement and its annexes how this Board consisting of 13 different HEI will function and how decision-making will be made. In this regard, the regulations remain vague. The panel was informed by the programme management that this will be an ongoing process after the test phase of some

of the course modules. The panel recommends more detailed regulations on assessment procedures of students than the basic information currently provided in the 'Exam Study Regulations' document.

The panel learned that at the start of each module, learners will be informed about the tools for completion, such as coursework and exams. Assessments will be marked based on transparent criteria, and grading rubrics will be provided. The teaching staff informed the panel they will offer timely feedback, typically within two weeks of submission, and learners can request additional feedback meetings.

However, the panel's question as formulated under Standard 5.1. is also relevant for this substandard: can the institutions involved guarantee that they can deliver on these intentions for 2,500 students, with a guarantee that there will then be sufficient staff capacity? In the absence of a cooperation agreement signed by the leadership of all institutions involved and given the exceptionally high student numbers for an intended master's programme, the panel doubts the feasibility of the programme's stated intention to provide qualitative assessments and feedback. The programme management indicates that the platform will support them in this regard. Given that this platform has not yet been developed, the latter issue also cannot be substantiated.

6 Student support

"The student support services should contribute to the achievement of the intended learning outcomes. They should take into account specific challenges of mobile students."

The panel assesses standard 6 as non-compliant.

The SER describes that the programme is committed to student support. Regular support for students in the programme will be provided by academic and support staff, with the programme coordinators holding primary responsibilities. Beyond this, the SER describes a comprehensive range of additional services that is intended to be offered to help students navigate various challenges they may encounter.

It is the intention of the programme that information about student support services can be accessed online through a student support services portal on the programme website. Students will be able to submit requests for support services via this portal, with programme coordinators serving as the initial point of contact to process these requests. The panel finds that the online platform must enable communication between different support services among the whole consortium. At the moment, this portal has not yet been designed and there are only the intentions of the programme management for now. In addition, the question remains how the programme management will be able to implement this if the targeted 2,500 students are enrolled. During the site visit, this could not be answered in the discussions with the panel. The consortium must ensure sufficient and adequate staff dedicated for the student support services, with clear attributions, as well as to ensure effective communication between staff recruited from different partner institution.

The student support services intend to include Learning Development Support Service, the Disability Support Service, The Careers and Opportunities Support Service, The Student Counselling and Wellness Service and the Library Service. The programme intends to ensure 'adequate resources,' including funding for the development and maintenance of essential materials. Additionally, financial support will be directed towards enhancing training for staff to provide support, and for students to utilize resources effectively.

The programme intends to offer additional on-site activities (such as workshops, hackathons, etc.) for students who are interested in participating in these activities. Students opting for on-site activities must receive the appropriate support when being mobile, as well as the recognition of these activities throughout the enrolment period.

The panel discussed with the programme managers and with the persons in the meeting regarding support services how this will work in practice. From this conversation it is clear that until now, no agreement has been reached on which HEI from the consortium will take up which service, whether some services will be carried out by several HEI and how this could be coordinated. To date, support services are a thinking exercise on paper that is still far away from an implementation phase. The panel therefore recommends to organise a division of labour with clear agreements. Each of the consortium's partner institutions must have clear responsibilities in the

implementation of the student support services. It is evident that this division of tasks and its financial implications must be reflected in a signed cooperation agreement.

7 Resources

The panel assesses standard 7 as non-compliant.

7.1 Staff

“The staff should be sufficient and adequate (qualifications, professional and international experience) to implement the study programme.”

The panel assesses substandard 7.1 as partially compliant.

The panel received the CVs of the teaching staff available. The panel could verify that the staff is adequate (in terms of qualifications and professional experience) to implement the study programme. The panel was interested to know more about the recruitment strategy. The panel learned that the consortium does not have a recruitment strategy for supplementary staff in the case of larger numbers of students. The hiring process for academic staff is left to each institution individually.

As mentioned before, the aim of the programme is to have 2,500 students by 2026. In the discussions held during the site visit, it was mentioned by the programme management that approximately 5,000 students would be needed for the programme to be financially self-sustained, while consortium representatives declared that they have the capacity to host between 10,000 to 30,000 students.

In an additional document, the programme management informed the panel that if 2,500 students enrol simultaneously, the student-to-teacher ratio is estimated between 27:1 and 54:1. Each module has an average of 4 teaching staff members (1 lead teacher + 3 assistants), totalling 92 faculty members (23x4) and resulting in a ratio of ~27:1. If every lecturer teaches two modules (not the case here), this would equate to 46 unique faculty members, yielding a ratio of ~54:1. The panel did not get a view on whether this is about FTE or number of persons teaching staff.

Even though a ratio of students per teaching staff is mentioned, a maximum number of students per module is not set, which might lead to ineffectiveness in teaching and learning approaches, especially those intended to foster collaborative work and interaction. Because student numbers can be unpredictable and reach exceptionally high proportions, there is well-founded doubt among the panel as to whether the programme will be able to succeed in ensuring that sufficient and adequately qualified staff are provided, especially in implementing student-centred learning. Programme management is confident of success, but cannot provide the panel with any details on how they plan to achieve it.

The panel learned that a train the trainer programme will be implemented for teaching staff. This initiative will provide training on the practical use of online tools, the Learning Management System (LMS), and pedagogical strategies for effective online course delivery. The panel commends this practice.

7.2 Facilities

“The facilities provided should be sufficient and adequate in view of the intended learning outcomes.”

The panel assesses substandard 7.2 as non-compliant.

The panel learned that this fully online master’s programme will be supported by a centralised digital platform designed to comprehensively meet learning and administrative objectives through highly integrated, secure, and accessible tools. To effectively offer and manage the programme, the platform intends to incorporate two vital components: a Customer Relationship Management (CRM) system and a Learning Management System (LMS) via Moodle.

Further enhancing the programme, integrated lab services will support hands-on learning in areas such as collaborative coding, private code repositories, and Continuous Integration/Continuous Deployment (CI/CD) workflows - key elements for developing practical skills alongside theoretical understanding. Participation in the online education programme requires students to have personal computing equipment, specifically a PC or laptop, as well as reliable internet access with sufficient bandwidth.

The platform serves as the central hub where everything will take place: from admissions, student support, and learning to assessment. It is therefore vital that the panel gains a solid understanding of how this system, which is expected to host the programme—and potentially up to 10,000 students simultaneously—will function.

The panel was not given access to the platform. During the site visit, a time slot was allocated for a presentation on the online programme-specific infrastructure. However, the programme management members present were unable to provide substantial information about the platform during this session. Subsequently, the panel received a document about the platform, which it reviewed thoroughly. This document revealed that the platform is not yet fully developed, and certain features, such as lab work, are listed as "to be addressed in a later phase". However, the panel points out that this is an essential aspect of the teaching and learning methods, as it is crucial to fulfil the requirements as described in the ECTS files.

The panel was informed that the platform is a deliverable of the D4S consortium project. While it was originally scheduled for completion in September 2024, it is now expected to be designed no earlier than the end of 2024. As a result, the panel could not access a testing phase of the platform.

The panel, therefore, had no means of verifying whether this platform, which is intended to be the cornerstone of the programme, will be functional or capable of fulfilling the many tasks it is expected to handle (as outlined earlier).

8 Transparency and documentation

“Relevant information about the programme like admission requirements and procedures, course catalogue, examination and assessment procedures should be well documented and published by taking into account specific needs of mobile students.”

The panel assesses standard 8 as partially compliant.

The programme management indicates that it will create a platform containing all relevant information for students: admission requirements and procedures, course catalogue, examination and assessment procedures. The panel observed that some documents have already been developed, such as clear ECTS files. However, other documents are currently either too vague or incomplete (as outlined earlier), such as the admission requirements, examination regulations, and the cooperation agreement. The programme coordinators have been tasked with further developing these documents first, ensuring they are transparent and can be clearly understood by all stakeholders.

Although the SER mentions that application processes will clearly be outlined, the panel wishes to underline that any ambiguity or perceived complexity in the implementation of these procedures could hinder transparency. Ensuring step-by-step guidance (code of practice) and making admission criteria explicit and easily understandable is vital. The SER suggests mechanisms for updating the curriculum and processes, yet transparency might be compromised if these changes are not promptly and clearly communicated to all stakeholders. Keeping students and faculty well-informed about updates through consistent communication channels is essential. Once the platform is implemented, the panel suggests that, to enhance transparency, the programme should maintain an up-to-date FAQ section and regularly communicate any changes to procedures or requirements through newsletters or announcements, ensuring all students are provided with the latest information.

While transparency is mentioned in the SER regarding assessment processes, in case of grading criteria or detailed rubrics that are not clearly explained or accessible to students, this could undermine transparency. Students should have a clear understanding of how their performance is evaluated and what is required to succeed. Transparency concerning this joint programme is of imperative importance, as it should allow easy comparison

and recognition of qualifications across borders, fostering mobility and following clear, transparent and fair processes within the context of mobility.

As indicated in Standards 6 and 7, there is currently no platform available, which prevented the panel from assessing how the intended transparency of the documents would be achieved. By the time of the site visit, neither the publicly available programme website nor the online collaborative platform had been established. The panel recommends that the online collaborative platform should ensure effective cooperation between partner institutions, functioning as a unique, unified platform with integrated modules to guarantee proper documentation. Additionally, the panel advises ensuring that the cloud infrastructure supporting the platform is not only secure but also highly scalable to accommodate growing student numbers and the development of more interactive and resource-intensive modules.

During the site visit, the panel asked each in all meetings how they will manage the fact that this master's programme may not be legally recognised in certain countries where partner universities in the consortium are located (see standard 1), and how this would be communicated. The panel did not receive a clear answer. However, the panel strongly recommends that universities in countries where the programme cannot be recognised as a master's clearly advertise this information. Under no circumstances should universities risk students not receiving this message. Failure to do so could not only harm the students, but also lead to significant reputational damage for the programme and the universities involved.

9 Quality assurance

“The cooperating institutions should apply joint internal quality assurance processes in accordance with part one of the ESG.”

The panel assesses standard 9 as partially compliant.

The programme has developed a comprehensive ‘Internal Quality Handbook 2024’. The panel was pleased to observe that this handbook includes various procedures related to the internal quality assurance of the programme: the Procedure for Academic Performance Analysis, Procedure for Student Module Level Satisfaction Survey, Procedure for Class Representative Meetings, Procedure for Suggestions and Complaints, and the Procedure for Quality Enhancement Planning. A section of the handbook is dedicated to the quality assurance policy, and it also describes the roles of the various governing bodies.

The Quality Enhancement and Curriculum Development Committee will monitor programme performance annually, summarizing data and findings, and suggesting implications. The Master's Board of Directors will review this document to identify potential strategic adjustments and interventions. The Annual Programme Review Report will include: approved changes to the curriculum and its components; a presentation and analysis of retention, progression, and completion statistics for the last two semesters, compared to previous years; a review of learner intakes; summaries of learner statistics per module with subsequent interpretations; summaries of feedback from students, lecturers, and industry experts, along with interpretations; reflections on programme performance, including quality assessments and potential strategies for improvement and review of required materials and equipment for students.

Notably, each course module is evaluated annually by two professional field representatives. The panel considers this a positive practice, as it ensures close alignment with the needs of the professional field. However, this also entails certain risks that the voice of the professional field dominates the needs to deliver the programme on level 7 EQF. Specifically, it is crucial to ensure that the learning outcomes for each module are consistently respected. Additionally, alignment across modules must be maintained to avoid disruptive overlaps. This requires ongoing monitoring, which should be conducted by educational support staff. The panel recommends that the programme ensures that the feedback loop will be closed, meaning that the information gathered through surveys and other satisfaction measurement instruments is used for the improvement of processes. Where possible, it is important to engage third-party evaluators or quality assurance experts to ensure that the programme's activities are in line with academic, legal, and regulatory standards. This helps build credibility and trust.

Students and staff participate in quality assurance through a structured system of surveys. While the Quality Handbook outlines internal quality assurance processes focusing on student feedback, it does not yet establish how students will be involved in the further development of the programme. The panel recommends that

students should be structurally involved in the governance of the programme, giving them an active voice rather than treating them merely as customers of the programme.

The programme encompasses a wide range of governing bodies (see context). The SER and the 'Internal Quality Handbook 2024' describe the roles of these bodies and their relationships with other governance entities. Most bodies are composed of representatives from the 13 HEIs in the consortium, without a hierarchy between degree-awarding and contributing institutions. However, the framework does not detail how a group of at least 13 HEIs can meet regularly to formulate policies or make unanimous decisions. The panel identifies this as a weak point. The governance structure assumes seamless collaboration among all partners, but during discussions, the panel found that smooth communication between partners is currently not a given (see below). This is particularly critical given the anticipated high student numbers. Furthermore, it remains unclear how a potentially large teaching staff group will be jointly involved in the programme. There is a risk that the programme could evolve into a collection of courses organized independently by different HEIs (and companies) without ensuring overall cohesion.

The panel recommends that the responsibilities of each body be further clarified to ensure coherence. Additionally, the structure involving 13 HEIs with collective decision-making should be reconsidered to evaluate its practicality.

The panel found indications that the programme's quality assurance is still in its infancy. During the site visit, there were frequent discrepancies between the individuals present in discussions and those listed in the site visit schedule (submitted only the day before the visit). In several meetings, it was unclear what contributions the participants could make to the discussions. For instance, when the panel asked attendees in the student support meeting about their roles in providing student support, they were unable to provide answers. These examples contribute to the panel's impression that, rather than organizing a truly joint master's programme, the focus lies on working on separate work packages within a European project, with the delivery of the master's programme assigned primarily to UDS and UPB. The panel states that this lack of ownership and communication undermines the essential jointness required for a master's programme.

Accreditation advice

Based on the SER, additional documents, and numerous interviews during its two-day site visit, the panel found that the programme achieved partial compliance on five standards and non-compliance on four standards of the nine standards of the framework of the European Approach for Quality Assurance of Joint Programmes. As a result, the panel concludes that the programme is in total non-compliance with the framework and consequently issues a negative recommendation for accreditation.

The panel wants to stress that the goal of creating a programme in collaboration with various HEIs and industry partners is ambitious and commendable. The panel believes this programme could clearly give potential added value in the market. It is evident that the needs in the field of cybersecurity have been well identified.

At this moment, however, the panel concludes that the master's programme is not ready to be launched. More time is needed to meet the conditions for accreditation under the European Approach framework and meet the European standards for Quality Assurance in the European Higher Education Area (ESG).

The panel observed that the provided information still contains many inconsistencies. Certain matters were contradicted during discussions, while supporting documents in turn provided different assertions. For example, it remains unusual that consortium partners were assigned different (degree-awarding) roles after the submission of the self-evaluation report.

The panel found that the programme focused on leveraging subject-matter expertise for the professional field. There is lack of educational expertise to meet both national and European educational standards. It is crucial that further development of the programme will be done with the support of education specialists and quality assurance experts from recognised universities with expertise in these areas.

A key aspect that is currently lacking is a mature cooperation agreement. This document serves as the foundation upon which the programme must be built. On the one hand, this document needs to contain much more

information than the current draft to assure that the programme can run properly. On the other hand, this document needs to be signed by the leadership of all HEI in the consortium.

Regarding student support, there are currently only plans which do not contain the necessary details. The division of responsibilities—which should be outlined in the cooperation agreement—has not yet been decided. As a result, the panel was unable to gain a clear understanding of what the programme will actually offer in terms of support or who will be responsible for it. The programme has recruited well-qualified staff to collaborate. However, to ensure the programme’s quality when the anticipated enrolment of a large group of students, financial responsibilities should be transparently outlined in the cooperation agreement.

The panel found that the programme relies on a centralised digital platform. The platform is still under development, with critical features yet to be addressed and a delayed timeline now extending to late 2024. Despite its pivotal role, the panel was unable to assess the platform’s functionality due to a lack of access and incomplete information during the site visit. This raises significant concerns about the programme’s readiness to handle its operational and educational objectives, including accommodating up to 10,000 students. The panel concludes that the timely completion, testing, and validation of the platform are essential to ensuring the programme’s potential success and reliability.

The programme has developed a comprehensive ‘Internal Quality Handbook 2024’, outlining key quality assurance procedures and governance structures. While the handbook reflects a structured approach to quality management and includes annual evaluations by professional field representatives, the panel noted gaps in addressing risks such as maintaining learning outcomes and module alignment. Governance challenges were also identified, as the involvement of 13 HEIs without clear decision-making mechanisms risks undermining coherence and collaboration. Furthermore, the quality assurance system remains in its initial stages, with discrepancies in leadership roles and limited evidence of joint ownership across institutions. Clarifying governance responsibilities, ensuring active student participation in programme development, and strengthening communication and collaboration to support the programme’s intended jointness and credibility is crucial.

The panel concludes that the plan for this master’s programme is not yet mature enough to start. The panel advises to first address the recommendations outlined in the report, in collaboration with qualified educational experts.

Final judgement of the assessment panel

Standard 1 - Eligibility	Non-Compliant
1.1 Status	Non-Compliant
1.2 Joint design and delivery	Partially Compliant
1.3 Cooperation Agreement	Non-Compliant
Standard 2. Learning Outcomes	Non-Compliant
2.1 Level [ESG 1.2]	Non-Compliant
2.2 Disciplinary field	Compliant
2.3 Achievement [ESG 1.2]	Partially Compliant
2.4 Regulated Professions	N/A
Standard 3. Study Programme [ESG 1.2]	Partially Compliant
3.1 Curriculum	Compliant
3.2 Credits	Compliant
3.3 Workload	Partially Compliant
Standard 4. Admission and Recognition [ESG 1.4]	Partially Compliant
4.1. Admission	Partially Compliant
4.2. Recognition	Partially Compliant
Standard 5. Learning, Teaching and Assessment [ESG 1.3]	Partially Compliant
5.1 Learning and teaching	Partially Compliant
5.2 Assessment of students	Partially Compliant
Standard 6. Student Support [ESG 1.6]	Non-Compliant
Standard 7. Resources [ESG 1.5 & 1.6]	Non-Compliant
7.1 Staff	Partially Compliant
7.2 Facilities	Non-Compliant
Standard 8. Transparency and Documentation [ESG 1.8]	Partially Compliant
Standard 9. Quality Assurance [ESG 1.1 & part 1]	Partially Compliant

Summary of the recommendations

- Ensure the joint programme is offered only by institutions that are recognised as HEIs in their respective countries.
- Limit the list of degree-awarding institutions to those recognised as HEIs in their respective countries.
- Establish efficient communication mechanisms within the consortium to ensure effective coordination and prevent administrative errors, such as neglecting to include a partner institution.
- Provide a signed cooperation agreement.
- Analyse national qualifications frameworks for master's degrees and adjust the programme design, where necessary, to align with the higher education systems of all participating countries.
- Align the disciplinary field with ISCED and comparable fields in the partner countries to ensure transnational comparability and compatibility.
- Pay close attention to ensure that annual content changes do not affect the programme's coherence
- Guarantee that admitted students meet the legal admission requirements in all consortium countries.
- Establish a clear admissions procedure in the cooperation agreement.
- Specify the recognition policy in the cooperation agreement, ensuring alignment with local eligibility requirements for admission at the partner universities.
- Develop more detailed regulations for assessment processes; Elaborate more thoroughly on the dissertation according to the specific needs of this programme.
- Clearly define the responsibilities of each partner institution in implementing student support services.
- Design an operational platform.
- Ensure the online platform enables communication between support services across the consortium.
- Provide appropriate support for students participating in on-site activities.
- Dedicate sufficient and adequately trained staff for student support services, with clear roles and effective communication across staff from different partner institutions.
- Develop a consortium-wide recruitment strategy to ensure the programme's effective implementation in teaching, learning, and administrative support.
- Ensure all facilities are operational by the programme's pilot phase, enabling feedback collection from students, learners, and staff, and use this feedback to improve facilities before the official programme launch.
- Clearly market the programme, specifying the distinctions between applicants with EQF level 6 qualifications and those without formal qualifications regarding degree or professional certificate awarding.
- Ensure the online collaborative platform facilitates effective cooperation between partner institutions and serves as a unified system with integrated modules for proper documentation.
- Transparently communicate that the programme is not recognised in some consortium countries.
- Ensure the feedback loop is closed by using information gathered through surveys and satisfaction measurement instruments to improve processes.
- Continuously involve students, graduates, and other stakeholders in the design, development, and further improvement of the programme.

Summary of the commendations

- The goal of creating a programme in collaboration with various HEIs and industry partners is ambitious and commendable.
- The needs in the field of cybersecurity have been well identified.
- The panel commends a train the trainer programme for teaching staff. This initiative will provide training on the practical use of online tools, the Learning Management System (LMS), and pedagogical strategies for effective online course delivery.

Annexes

Annex 1: Administrative details of the programme

Name of the institutions	<p>UPB (Politehnica University of Bucharest), RO</p> <p>UDS (German University of Digital Science), GER</p> <p>NCI (National College Ireland), IE</p> <p>MTU (Munster Technological University), IE</p> <p>UNIBS (University of Brescia), IT</p> <p>BUT (Brno University of Technology), CZ</p> <p>UNIRI (University of Rijeka), CRO</p> <p>POLIMI (Polytechnic University of Milan), IT</p> <p>UNIR (International University of Rioja), ES</p> <p>VMU (Vytautas Magnus University), LT</p> <p>MRU (Mykolas Romeras University), LT</p> <p>CY (Cergy Paris University), FR</p> <p>UNI KO-LD (University of Koblenz-Landau), GER</p>
Address, institution website	<p>Splaiul Independenței no. 313, sector 6, Bucharest, Romania</p> <p>www.upb.ro</p>
Name, function, phone and e-mail of the contact person	<p><u>Contact persons from UPB (Project Coordinator):</u></p> <p>Florin Pop, Head of Doctoral School of Automatic Control and Computer Science, florin.pop@upb.ro</p> <p>Petrisor L. Tuca, Head of Quality Assurance Department, petrisor.tuca@upb.ro</p> <p><u>Contact persons from UDS (Coordinator Accreditation):</u></p> <p>Sophie Schulz, Head of Strategy, sophie.schulz@german-uds.de</p> <p>Florian Frank, Project Leader, florian.frank@german-uds.de</p>
Name of the programme (degree, qualification, eventually title that holders of the degree conferred by this programme may use)	<p>Master in Cybersecurity Management & Data Sovereignty (120 ECTS)</p>
Potential programme routes for working students, full-time/part-time education, day/evening trajectories, different formats of certification	<p>Full-time</p> <p>Part-time</p> <p>Part-time accelerated</p>

Tracks	
Level and orientation	7
(Parts of) field(s) of study	Cybersecurity, Data Sovereignty, Management
Language of instruction	English
The location at which the programme is taught	Online
Workload (in ECTS)	120 ECTS (full program), 10 ECTS (each micro-credential)
Possible, relevant collaborations with other (higher education) institutions and/or organizations	
Additional national and/or international regulations applicable to the programme(s)	

Annex 2: Short CV panel members

Valentina E. Balas (chair):

Valentina E. Balas is Professor in the Department of Automatics and Applied Software at the Faculty of Engineering, “Aurel Vlaicu” University of Arad, Romania. She holds a Ph.D. Cum Laude, in Applied Electronics and Telecommunications from Polytechnic University of Timisoara. Dr. Balas is the author of more than 400 research papers. Her research interests are in Intelligent Systems, Fuzzy Control, Soft Computing, Smart Sensors, Information Fusion, Modeling and Simulation. She is the Editor-in Chief to IJAIP and IJCSysE journals in Inderscience, member in the Editorial Board of several national and international journals and evaluator expert for national, international projects and PhD Thesis. Dr. Balas is the director of Intelligent Systems Research Centre at Aurel Vlaicu University of Arad. During the interval 2021-2022 she was a member of IEEE European Public Policy Committee Working Group on ICT. From May 2023 Dr. Balas is associate member of Romanian Academy of Scientists. She is recipient of the “Tudor Tanasescu” Prize from the Romanian Academy for contributions in the field of soft computing methods (2019), “Stefan Odobleja” Prize from Romanian Academy of Scientists (2023 and 2024) and Diploma - Section Information Technology from The General Association of the Engineers in Romania (AGIR) 2023.

Constandinos X. Mavromoustakis:

Constandinos X. Mavromoustakis is currently a Professor in the Department of Computer Science at the University of Nicosia, Cyprus, and leads the Mobile Systems Lab. Professor Mavromoustakis served as the Chair of the IEEE R8 regional Cyprus section from November 2019 to January 2023. Since May 2009, he has also served as the Chair of the C16 Computer Society Chapter of the Cyprus IEEE section. Prof. Mavromoustakis has an extensive body of research work in mobile and wearable computing systems and the Internet-of-Things (IoT), which includes patents and numerous refereed publications (over 400), as well as several books published by IDEA/IGI, Springer, and Elsevier. He has served as a consultant to various industrial bodies, including Intel Corporation LLC, and is a member of technical committees such as the European Union Agency for Cybersecurity (ENISA). Moreover, he is a management committee member of the IEEE Communications Society (ComSoc) Radio Communications Committee (RCC) and a board member of the IEEE-SA Standards IEEE SCC42 WG2040. Professor Mavromoustakis has served as a certified member for different academic external accreditation panels for higher education institutions and has participated in several FP7/H2020/Eureka and national projects.

César Fernández González

César Fernández González is a computer engineer with a long career in the private sector. He graduated from the University of Oviedo and later specialized in systems administration and cybersecurity. He has developed a successful career in the field of high availability infrastructure architecture, cybersecurity and disaster recovery. With extensive experience in large-scale projects in the financial and industrial sectors, César has demonstrated his ability to design and implement robust and scalable infrastructures. Since 2021, he is a founding member and CTO of an MSSP (managed security service provider) that currently focuses on industrial cybersecurity and creating its own products to protect critical infrastructures.

Irina Duma:

Irina Duma has extensive experience both in student representation and quality assurance of higher education. During her bachelor's and master's studies, she was a student representative within the faculty council and the university senate, as well as Vice President of the National Alliance of Student Organizations in Romania (ANOSR). For the past seven years, she gained wide experience in external quality assurance procedures conducted by the Romanian Agency for Quality Assurance in Higher Education (ARACIS) - as student representatives in review panels, while since 2019 she has been a member of the European Students' Union (ESU) QA Pool (including two years as Steering Committee member), where she worked with various quality assurance agencies across the EHEA. She is currently pursuing her PhD in Mechanical Engineering within the Technical University of Cluj-Napoca, Romania.

Annex 3: Visit schedule

18 November 2024

start	end	time	
9:00	11:30	2:30	preparatory panel meeting
11:30	13:00	1:30	interview with programme management
13:00	14:00	1:00	panel lunch
14:00	15:00	1:00	interview with professional field representatives
15:00	15:15	0:15	panel meeting
15:15	16:00	0:45	interview with students
16:00	16:30	0:30	panel meeting
16:30	17:30	1:00	interview with teaching staff
17:30	18:00	0:30	online programme-specific infrastructure
18:30			diner panel

19 November 2024

start	end	time	
8:45	9:30	0:45	topical meeting: interview on legal framework and joint QA
9:30	10:00	0:30	topical meeting: interview on student support
10:00	11:00	1:00	consultation hour
11:00	11:30	0:30	panel meeting
11:30	13:00	1:30	co-creative conversation with programme management
13:00	14:30	1:30	lunch + final panel meeting
14:30	14:45	0:15	oral report

Annex 4: Overview of consulted documents

- SER
- Document with updates on the SER and annexes
- Annex 1. Cooperation Agreement
- Annex 2. Module Handbook
- Annex 3. Study and Examination Regulations
- Annex 4. Academic Staff CVs
- Annex 5. Internal Quality Handbook
- Annex 6. Student Handbook
- Annex 7. Sample Degree Certificate
- Annex 8. Sample Diploma Supplement
- Annex 9. Sample Evaluation Questionnaires

Additional requested information:

- Document about UDS by the German Scientific Council
- D3.1 Digital Learning Platform and Teaching Tools v1; Set up the Digital Learning Platform and Teaching Tools for the online master's programme
- D2.2: DIGITAL4Security Course Curriculum
- Manual for the modules "Dissertation" and "Internship" Universität Koblenz
- Cooperation agreement with signature of UDS
- DIGITAL4Security Curriculum - Maintenance Work Package 2, Task 2.6 (Preliminary Draft)

Annex 5: Review timeline

Below is an overview of the agreed review timeline. The actual dates are shown in brackets.

- Preparatory meeting: July 2024
- Panel composition: End of August - early September 2024 (actual date: 4 October 2024)
- Signing contract: 6 September 2024 (actual date: 7 October 2024)
- Preparatory meeting with programme management: 11 October 2024
- Deadline submission of SER: 17 October 2024 (actual date: 26 October and 1 November 2024)
- Panel training: 5 November 2024, 9h-12h30 CET
- Visit: 18 - 19 November 2024
- Draft report to panel: 26 November 2024
- Draft report to programme management: 3 December 2024 (actual date: 5 December due to breach of contract)
- Eventual comments from programme management to panel: 9 December 2024, noon: (actual date: 10 December 2024)
- Deadline final reaction panel: 13 December 2024
- Report for accreditation to VLUHR QA Board: 16 December 2024
- Accreditation decision VLUHR QA Board: 23 December 2024
- Final deadline: 31 December 2024

ACCREDITATION DECISION

VLUHR QA does not grant accreditation to the programme

Master in Cybersecurity Management & Data Sovereignty

offered by

D4S consortium

Politehnica University of Bucharest, German University of Digital Science, National College of Ireland, Munster Technological University, University of Brescia, Brno University of Technology, University of Rijeka, Polytechnic University of Milan, International University of Rioja, Vytautas Magnus University, Mykolas Romeris University, Cergy Paris University, and the University of Koblenz-Landau

The programme does not deliver the required quality to offer the degree of master in an internationally accepted manner.

VLUHR QA reaches this conclusion based on the negative review of the panel that conducted the external assessment according to its Manual for the European Approach for Quality Assurance of Joint Programmes (January 2020). VLUHR QA endorses the panel's recommendations. The report prepared by the panel forms an integral part of this decision.

VLUHR QA makes this decision in application of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG).

Brussels, 23 December 2024



Mia Sas

President of the VLUHR Quality Assurance Board