



ASIIN Certification Report

*Based on Accreditation Report for Joint Master's degree programme
Advanced Digital Technologies for Business (formerly: Advanced Digital Skills)*

Modules

Digital Transformation

AI for Business

Data Science for Business

Cyber Security for Business

Cloud Computing for Business

Postgraduate Certificate Course

Advanced Digital Skills

Provided by

National College of Ireland

Linköpings Universitet

Université Paris 8 Vincennes-Saint-Denis

Universite di Bologna

Universidade Nova Lisboa

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A About the Certification Process

| Title of the Modules / Courses | Previous certification |
|---|------------------------|
| Digital Transformation | – |
| AI for Business | – |
| Data Science for Business | – |
| Cloud Computing for Business | – |
| Postgraduate Certificate Course in Advanced Digital Skills | – |
| <p>Date of the contract: 23.11.2023</p> <p>Submission of the final version of the self-assessment report: 24.06.2024</p> <p>Date of the onsite visit: 05.06.2024</p> <p>at: National College of Ireland, Dublin</p> | |
| <p>Peer panel:</p> <p>Prof. Dr. Susanne Robra-Bissantz, Technical University of Braunschweig</p> <p>Prof. Dr. Ralf Kramer, Stuttgart University of Applied Sciences</p> <p>Dr. Jan Christian Dammann, Senior Software Architect, Iteratec GmbH</p> <p>Alexandre Al Ajroudi, Student at Institut National des Sciences Appliquées de Toulouse</p> | |
| <p>Representative of the ASIIN headquarter: Dr. Siegfried Hermes</p> | |
| <p>Responsible decision-making committee: Certification Commission</p> | |
| <p>Criteria used:</p> <p>Standards for the Certification of (Further) Education and Training for courses and modules related to Computer Sciences, Technology, Natural Sciences and Business Economics as of 26.06.2020.</p> <p>Standards and Guidelines for Quality Assurance in the European Higher Education Area as of 15 May 2015.</p> | |

A About the Certification Process

In order to facilitate the legibility of this document, only masculine noun forms will be used hereinafter. Any gender-specific terms used in this document apply to both women and men.

B Characteristics of the Modules and the Postgraduate Certificate Course

| A 5. | a) Name of the module / course | A 6. | b) Degree awarded upon conclusion | A 7. | c) Corresponding level of the EQF | A 8. | d) Mode of Study | A 9. | e) Duration & Credit Points | A 10. | f) First time of offer & Intake rhythm | A 11. | g) Number of students per intake | A 12. | h) Fees |
|------|---|--------------------------|-----------------------------------|------|-----------------------------------|-----------|------------------|-----------------|-----------------------------|----------------------------------|--|-------|----------------------------------|--------|---------|
| | Module Digital Transformation | n.a. | | n.a. | | part time | | 1 Semester | | Twice per year, September 2024 | | 150 | | €1,473 | |
| | Module AI for Business | n.a. | | n.a. | | part time | | 1 Semester | | Twice per year, September 2024 | | 150 | | €1,473 | |
| | Module Data Science for Business | n.a. | | n.a. | | part time | | 1 Semester | | Twice per year, September 2024 | | 150 | | €1,473 | |
| | Module Cybersecurity for Business | n.a. | | n.a. | | part time | | 1 Semester | | Twice per year, September 2024 | | 150 | | €1,473 | |
| | Module Cloud Computing for Business | n.a. | | n.a. | | part time | | 1 Semester | | September 2024 Twice per year | | 150 | | €1,473 | |
| | Postgraduate Certificate course Advanced Digital Skills | Postgraduate certificate | | 7 | | part time | | 2 – 3 Semesters | | September 2024 Twice per year | | 150 | | €2,600 | |

For the Module Digital Transformation, the module description states the following **intended learning outcomes**:

- LO1: Analyse and synthesise the key concepts and enablers of digital transformation.
- LO2: Critically evaluate digital transformation paradigms and their impact on innovative business models.
- LO3: Assess and strategise the deployment of strategic resources for digital transformation.
- LO4: Design and implement advanced strategies for digital business transformation.

For the Module AI for Business, the module description states the following **intended learning outcomes**:

- LO1: Analyse, synthesise, and innovate within artificial intelligence and machine learning, emphasising critical understanding and the capability to advance the field.
- LO2: Design, train, and critically evaluate advanced machine learning models, focusing on innovative data and optimisation strategies to boost performance.
- LO3: Employ innovative techniques for rigorous machine learning model performance assessment, interpret results, and communicate implications across contexts effectively.
- LO4: Apply strategic thinking in AI and machine learning for complex applications, assess effectiveness critically, and propose innovative solutions or improvements.
- LO5: Critically explore AI and machine learning's ethical, societal, and environmental impacts, and propose ethical, sustainable development and implementation practices.

For the Module Data Science for Business, the module description states the following **intended learning outcomes**:

- LO1: Evaluate and integrate Data Science concepts, theories, and practices to analyse and solve real-world problems, employing innovative strategies and techniques for data interpretation and insight extraction.
- LO2: Apply advanced processes, methods, and algorithms in Data Science to address complex situations with originality in problem-solving, including the development and optimization of models for impactful real-world applications.
- LO3: Conduct comprehensive data analysis using a variety of statistical and machine learning techniques to inform decision-making, synthesising data insights for effective communication to diverse audiences.
- LO4: Design, implement, and critically assess advanced visualisations, models, and Business Intelligence outputs, demonstrating mastery in communicating complex data insights and optimising model performance.

For the Module Cybersecurity for Business, the module description states the following **intended learning outcomes**:

B Characteristics of the Modules and the Postgraduate Certificate Course

- LO1: Analyse and critically evaluate vulnerabilities in personal and organisational data systems to identify potential security breaches and suggest mitigative strategies.
- LO2: Synthesise and apply advanced concepts and techniques of cyber-attacks to simulate potential security breaches, demonstrating a comprehensive understanding of cyber threat landscapes.
- LO3: Design and implement robust strategies for the protection of personal and organisational data, utilising advanced encryption techniques and security protocols to mitigate potential threats.
- LO4: Evaluate and integrate sophisticated tools and methodologies for the prevention and detection of cyber-attack incidents, demonstrating an ability to anticipate and counteract emerging cyber threats.
- LO5: Critically assess and debate cybersecurity legal and ethical issues, formulating well-justified recommendations for policy and practice that reflect an advanced understanding of the complexities and responsibilities in the field of cybersecurity.

For the Module Cloud Computing for Business, the module description states the following **intended learning outcomes**:

- LO1: Assess core principles, frameworks, development methodologies and tools for the adoption of Cloud Computing solutions to support and enable digital business transformation.
- LO2: Critically analyse the governance and security challenges associated with cloud-based systems to identify and evaluate candidate cloud security architectures and deployment strategies.
- LO3: Evaluate and assess the intersection and impact of Fog and Edge Computing in relation to Cloud Computing.
- LO4: Critically appraise the wide range of existing and emerging cloud services (e.g., storage, machine learning, compute, analytics, quantum computing, etc.) and develop strategies to leverage such services for digital business transformation.

For the Postgraduate Certificate Course Advanced Digital Skills, the Digital4Business-Report states the following **learning objectives**:

“The aim of the Postgraduate Certificate in Advanced Digital Skills is to offer learners a short programme of study with a focus on Digital Transformation in conjunction with a number of key advanced digital skills domain areas for business. The Postgraduate Certificate will appeal to those learners already in employment who wish to develop skills in particular current technology domains to support digital transformation in business.”

For the Postgraduate Certificate Course, the Digital4Business Report presents the following **schedule**:

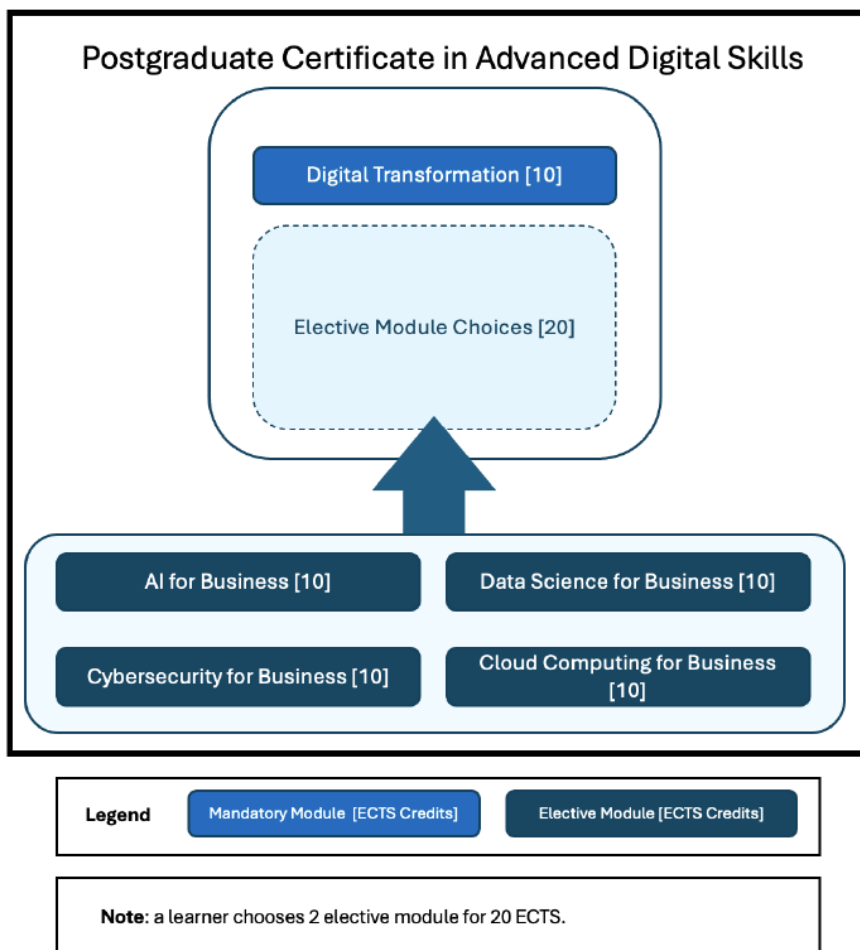


Figure 1: Postgraduate Certificate in Advanced Digital Skills Structure

C Peer Report for the ASIIN Certificate

Preliminary Note

The present certification procedure has been conducted in combination with an accreditation procedure for the Joint Master's Programme in Advanced Digital Skills (now renamed "Professional Master's in Advanced Digital Technologies for Business"), which has been developed within the framework of the Digital4Business consortium composed of the applicant Universities (plus two) in cooperation with the Consortium's industry partners.

The modules and the Postgraduate Certificate course are constitutive parts of the curriculum of the Joint Master's programme – de facto a combination of the module Digital Transformation and two other modules of the Joint Master's programme. The experts' judgment on many features of the Joint Master's programme is therefore also relevant to the modules and the Postgraduate Certificate course. Consequently, the certification report will refer to the accreditation report where applicable in order to avoid redundancy and to focus on those issues that have not yet been addressed in the accreditation process of the Joint Master's programme. In this sense, the certification report reflects the fact that the accreditation of the Joint Programme and the certification of the modules and the Postgraduate Certificate Course have been combined procedurally.

The deficiencies and shortcomings of the Joint Master's programme identified in the accreditation report, which also apply to the individual modules and/or the Postgraduate Certificate course will be adopted accordingly, together with the conclusions of the experts. This applies to both the preliminary and the final judgements of the experts.

To maintain full compliance with part 1 of the ESG, it is necessary to consider the accreditation report the basis of the present certification report. The following table provides a synopsis of the reports and criteria addressed. It indicates where the experts' judgement is already reflected in the accreditation report and where it is substantiated in the certification report.

| Crit. Cert. | Crit. Accr. | Subject | Substantiation in Cert. Report relating to |
|--------------------|--------------------|--|---|
| 1.1 | 1.1 | Learning outcomes (programme/module level) | Postgraduate Cert. course |

| Crit. Cert. | Crit. Accr. | Subject | Substantiation in Cert. Report relating to |
|--------------------|--------------------|---|---|
| 1.2 | 1.2, 1.3 | Contents, name and structure | Postgraduate Cert. course |
| 1.3 | 1.6 | Didactic and Teaching Methodology | – |
| 1.4 | 1.4 | Admission requirements | – |
| 1.5 | 1.5 | Workload | Modules, Postgraduate Cert. course |
| 2 | 2 | Examination System | – |
| 3.1 | 3.1, 3.2 | Staff and Student Support | Modules, Postgraduate Cert. course |
| 3.2 | 3.3 | Institutional Setting, Material and Financial Resources | – |
| 4 | 5 | Quality Management | – |
| 5.1 | 4.1 | Module Descriptions | – |
| 5.2 | 4.2, 4.3 | Relevant Documents | Modules, Postgraduate Cert. course |

Table 1: Synopsis of references to Accreditation Report for Joint Master's in Advanced Digital Technologies for Business

Obviously, the aforementioned Joint Master's initiative aims to address a wide range of target groups in business and industry who need to broaden their competencies to manage digital transformation processes in their organisations. Although the Joint Master's is designed to be delivered in a variety of modes (full-time and two part-time modes), allowing professionals with limited availability to enrol, it may still be too intensive and time-consuming for many of them. Therefore, the intention of higher education institutions to offer key modules of the Joint Master's separately is plausible.

The provision of individual modules or a combination of modules (Postgraduate Certificate course) could be an attractive alternative for professionals interested in acquiring new skills in targeted digital skills areas. At the same time, the accumulation of micro-credentials could provide a viable exit route for learners who are unable to complete the Master's programme, or could otherwise be an option for individuals who wish to complete a full Master's at a more gradual pace. None of the former, however, were addressed by the partner universities.

Nevertheless, the rationale for partnering universities to offer these microcredentials is compelling. The difficulties, the experts encountered with the application for certification of these micro-credentials is that barely any information on this has been provided by the partner universities at the time of the site visit – with the sole exception of the module descriptions of the respective modules. In particular, the framework conditions for the micro-credentials (modules and Postgraduate Certificate course) are unclear.

At the request of the experts, the partner HEIs provided a short report with some key information on the general context, main target groups, admission requirements, assessment methods, learning intake and delivery, quality assurance, and relevant rules related to these micro-credentials.

The report serves as a supportive basis for the ensuing complementary assessment of the modules and the Postgraduate Certificate course.

1. Concept, Structure and Implementation

Criterion 1.1 Learning outcomes

Evidence:

- Objectives – Module-Matrix
- Module Handbook
- Audit discussions

Preliminary assessment and analysis of the peers:

Cf. reference report Joint Master's programme in Advanced Digital Technologies for Business, sec. 1.1, 1.3., 1.5.

As already mentioned, the experts generally welcome the idea to provide individual modules of the Joint Master's programme in Advanced Digital Technologies for Business as well as a combination of them (Postgraduate Certificate course) as autonomous teaching and learning experiences. Thus, University of Bologna, Linköping's University, New University of Lisbon, University Paris 8 Vincennes Saint-Denis, and National College of Ireland, respectively, present the modules Digital Transformation, AI for Business, Data Science for Business, Cybersecurity for Business and Cloud Computing for Business as stand-alone micro-credentials.

The review team also agrees with the selection of the modules, as these are considered core modules of the programme ideally suited for the purpose of stand-alone learning units. Concerning the intended learning outcomes of these micro-credentials, the conceptual context of the design of the Master's programme needs to be considered. From the start, the Master's programme – developed by a consortium of universities and industry partners in a EU project – has not been targeted towards applicants of fully-fledged computer science or business informatics degree programmes. Rather, the design of the programme is aimed towards a range of altogether 16 different professional company or organizational roles, from Procurement Managers to Small Business Owners to HR Professionals to Junior Software Engineers, and to Facility Management Professions. The unifying idea behind this is not to equip these diverging target groups with a highly specialist digital skills set, but to provide all with a deep understanding of advanced topics in the digital skills area corresponding to the occupational role within their company/organization.

The conceptual framework of the referenced Joint Master's programme has to be considered in case of the individual modules and the Postgraduate Certificate course as well. As the modules (and the Postgraduate Certificate course) are part of the Master's programme, they are catering to the same target groups promising to enable them to implement and lead digital transformation processes within their company/organization. Consequently, as indicated in the reference report, the focal point of the relevant digital skills areas (AI, Data Science, Cloud Computing, Cybersecurity), is always the way how a broadened and deepened understanding of those skills can be utilized to find adequate business solutions in a digitalized world. From that perspective, transferable competences such as solving business problems related to the learner's present or future company role are an essential learning objective of each micro-credential and, similarly, of the Postgraduate Certificate course. However, as stated in the reference report, this feature is underexposed in the description of the intended learning outcomes of the modules, although it is addressed to a certain degree in the goal description of some of them.

Similarly, to the aforementioned five stand-alone modules, a combination of these modules totaling 30 ECTS and including the mandatory Digital Transformation module (10 ECTS) will be considered a Postgraduate Certificate course and the graduates will be awarded a Postgraduate Certificate. Even though the Digital Transformation module must be passed mandatorily in this course, there is obviously a range of possible combinations with two of the remaining four modules each. The experts consider all of these combinations suitable to reasonably supplement the learner's educational and/or professional background with relevant advanced digital skills. However, they also are of the opinion that the qualification profile, which the learners achieve when completing the course, independent of the individual module combination, needs to be clearly described. Moreover, it is obvious that the

Postgraduate Certificate course LOs must be different from the Joint Master's programme LOs. Similarly, they cannot simply summarize the LOs of the combined modules. The experts expect that the course LOs of the Postgraduate Certificate course will be specified accordingly in the ongoing certification procedure.

| |
|---|
| Criterion 1.2 Contents and structure |
|---|

Evidence:

- Document “Conceptual Framework for DIGITAL4Business Micro-credentials in Advanced Digital Skills – DIGITAL4Business Postgraduate Certificate in Advanced Digital Skills”
- Module descriptions
- Curriculum/module overview
- Audit discussions

Preliminary assessment and analysis of the peers:

Cf. reference report Joint Master's programme in Advanced Digital Technologies for Business, sec. 1.3., 1.5.

The experts positively note that the proposed micro-credentials (modules and Postgraduate Certificate course) are fitting well with the needs of the industry for up- and re-skilling their workforce in an era of rapid digitalization of businesses and thus with the very idea of lifelong learning. As mentioned, they consider the selection of micro-credentials reasonable, not least because they pay due respect to sustainability aspects of business modules (“service eco-systems”). From the more detailed introduction into the contents of the modules during the onsite visit, the experts also conclude that these are generally up-to-date with cutting-edge knowledge in the field.

However, as indicated in sec. 1.1 with respect to the intended module LOs, the dimension of transferability of the advanced digital skills needs to be more transparent in the description of the learning contents as well, if it is delivered there. Otherwise, especially problem-solving competences related to business issues will have to be included in the curriculum as an additional competence feature.

Criterion 1.3 Didactics

Cf. reference report Joint Master's programme in Advanced Digital Technologies for Business, sec. 1.6.

Criterion 1.4 Admission requirements

Evidence:

- “Conceptual Framework [...]”, chapter “Admission Requirements”, p. 7
- Sec. 4.5, 5.1 and 5.3 of the Cooperation Agreement
- Study and Examination Regulations 2024, sec. “Admissions”, pp. 5-8
- Audit discussions

Preliminary assessment and analysis of the peers:

Cf. reference report Joint Master's programme in Advanced Digital Technologies for Business, sec. 1.4.

As the “Conceptual Framework” paper for the micro-credentials under review (including the Postgraduate Certificate course) clarifies, admission requirements for the micro-credentials and the Postgraduate Certificate programme adhere to the same requirements as the Joint Master's Degree in Advanced Digital Technologies for Business and the referenced Study and Examination Regulations document therein. However, this is not self-evident and must be explicitly stated in the relevant documents (Cooperation Agreement; Study and Examination Regulations) to provide transparency and clarity for the relevant stakeholders. Otherwise, the fundamental concerns raised by the experts with regard to these admission requirements are therefore also valid for the micro-credentials. It is generally welcomed to set broad eligibility requirements for the micro-credentials in order to open up an advanced digital skills portfolio to a spectrum of applicants with different academic and/or professional backgrounds. However, it is also strongly sensed that the minimum subject specific (technological as well as scientific) requirements applicants need to bring with them must be clearly communicated. While this could be ensured in different ways depending on the approach adopted by the partner institutions, it will be essential to specify the required technical/scientific knowledge for each module if the entry requirements are to support the selection of appropriate learners for the micro-credential.

The experts appreciate the existence of boot camps in several subject-related areas of the micro-credentials under review. It seems that, so far, the partner HEIs are not considering

to systematically use them for learners to catch up with missing prerequisite knowledge. Given the diversity of learners' educational backgrounds, the review team suggests regularly using these boot camps in the selection process to address knowledge gaps and provide learners with a comparable subject-specific knowledge base.

Criterion 1.5 Workload

Evidence:

- “Conceptual Framework [...]”, in particular chapter “Learner Intake & Delivery Schedules”, p. 8
- Module Handbook
- Audit discussions

Preliminary assessment and analysis of the peers:

Cf. reference report Joint Master's programme in Advanced Digital Technologies for Business, sec. 1.5.

The experts learn from the 'Conceptual Framework' that learners of the individual modules and the Postgraduate Certificate course are expected to be enrolled in the modules/course alongside their peers in the two part-time versions of the Joint Master's Degree in Advanced Digital Technologies for Business (3 and 4 semester part-time versions). Accordingly, individual learner cohorts will be formed according to the chosen mode of study (full-time, part-time) and the learners of the micro-credentials (including those of the Postgraduate Certificate course) will complement the part-time cohorts of the Master's programme. This means that all modules of the Master's programme have to be delivered at least once in each semester. The “Conceptual Framework” paper further states that “separate delivery instances” would be created if sufficient lecturers were available at the offering institution, should the number of participants in the part-time cohorts, which include the learners of the micro-credentials, exceed 150. If not, learners would be enrolled “on the next available iteration of the module's delivery”.

The experts do not understand why micro-credential learners are included in the part-time Masters cohorts but not in the full-time cohorts. Obviously, this decision does not affect the rhythm of enrolment, nor will it have a tangible steering effect with regard to the teaching capacity of the universities involved. In addition, the module coordinators have not presented a consistent and plausible idea of the timetable and workload distribution for each of the micro-credentials. Given the European background of the HEI consortium and the

different teaching/learning cultures involved, the experts consider it necessary to provide a coherent organisational/semester plan for the micro-credentials, including a consistent overview of the workload distribution for each one.

In the reference report, the experts have positively taken note of the workload surveys to be conducted according to the Quality Handbook developed by the consortium for the Joint Master's programme. However, this QA instrument has not been further elaborated in the handbook. For instance, it is not detailed how often such surveys shall be conducted or on whether student workload shall be evaluated on programme or module or even unit level or whether a combination of all shall be established. The review team therefore concludes that the HEIs should detail and ensure a systematic and regular monitoring of the credit point allocation in order to identify and, if necessary, adapt the credit point allocation or the contents of the modules.

Final assessment of the peers after the comment of the Provider regarding criterion 1:

The experts welcome the constructive comments of the D4B consortium, particularly concerning the criteria 1.1 (learning objectives), 1.4 (admission criteria) and 1.5 (workload).

Learning objectives (crit. 1.1)

It is acknowledged and positively rated that the consortium plans to specify the learning outcomes of the Postgraduate Certificate course, while accepting that these need to be clearly differentiated from the LOs of the related Joint Master's programme. As this announcement has not yet materialized, more adequate learning objectives for the Postgraduate Certificate still need to be formulated (*see below, sec. F, requirement 9*).

In addition, the experts' critical remarks on the necessity to adequately reflect the business problem-solving skills also in the LOs of the modules remain valid (*see below, sec. F, requirement 1*).

Admission criteria (crit. 1.4)

The D4B consortium's clarification that the admission criteria of for the micro-credentials (modules) as well as for the Postgraduate Certificate are the same as those for the Joint Master's programme and that this will be clearly stated in the related official documents. However, the experts underline that the technical and scientific prerequisites of the individual modules must be communicated just as clearly. Both issues remain to be solved and are therefore maintained as a requirement (*see below, sec. F, requirements 2 and 7*).

In this respect, the experts highlight again the recommendable features of the already existing boot camps (see below, sec. F, recommendation 1).

Workload (crit. 1.5)

The experts appreciate the D4B consortiums indication to “provide a coherent schedule/semester plan, including an overview of the workload distribution for the micro-credentials, in due time before the start of the programme.” As this is not done yet, it remains as a requirement (see below, sec. F, requirement 3).

The D4B consortium’s positive response to the experts’ comments on the benefits of systematic and regular monitoring of the learners’ workload is well received. As this also remains to be done, a corresponding requirement is formulated.

The experts conclude that criterion 1 is partially fulfilled.

2. Examination: System, Policy and Implementation

Criterion 2 Exams: System, policy and implementation

Evidence:

- “Conceptual Framework [...]”, in particular chapter “Learner Intake & Delivery Schedules”, p. 8
- Audit discussions

Preliminary assessment and analysis of the peers:

Cf. reference report Joint Master’s programme in Advanced Digital Technologies for Business, sec. 2.

The experts acknowledge that the assessment of the micro-credentials (individual modules or Postgraduate Certificate course) is subject to the same regulatory framework as the Joint Master’s programme. Similarly, they note that the details of the individual assessment methods are presented in the respective module descriptions. According to the information provided, this also applies to the Postgraduate Certificate course, where the optional module combinations are subject to the regular assessment rules and the certificate is awarded upon completion of the constituent modules.

However, even if there is no difference in the assessment of the micro-credentials as compared to the Joint Master’s programme, this needs to be transparently communicated and bindingly implemented. This could be done either by supplementing the Cooperation

Agreement and the relevant regulations of the Master's programme and/or by creating separate documents pertaining to the micro-credentials. Any other solution that the partner HEIs find more suitable for this purpose could be considered appropriate, as long as it ensures transparency and reliability in how the micro-credentials are assessed and completed.

Final assessment of the peers after the comment of the Provider regarding criterion 2:

The experts note the D4B consortium's repeated indication that the assessment forms and criteria are fully covered by the corresponding examination system of the Joint Master's programme. They also welcome that the consortium plans to clearly and transparently communicate this in the official documents.

As this is not achieved so far, two corresponding requirements address different aspects of the issue (*see below, sec. F, requirements 7 and 8*).

The experts conclude that criterion 2 is partially fulfilled.

3. Resources: Staff and Infrastructure

Criterion 3.1 Staff

Cf. reference report Joint Master's programme in Advanced Digital Technologies for Business, sec. 3.1., 3.2.

In the reference report, the expert group highlighted the contractual commitment of the participating universities to provide the Joint Master's programme with highly qualified staff in the field. In view of this, the experts are convinced that the Master's programme is well staffed in terms of quantity and quality. As this commitment also applies to the micro-credentials under review (including the Postgraduate Certificate programme), the experts extend their assessment to these offerings, although the number of students in either of the variants is unclear as of now.

Criterion 3.2 Institutional setting, financial and material resources

Cf. reference report Joint Master's programme in Advanced Digital Technologies for Business, sec. 3.3.

The expert team reiterates the key aspects of its assessment in the reference report and again emphasises the contractual commitment of the HEIs involved, not only in terms of

teaching, support and administrative staff, but also in terms of funding strategy and availability of physical resources. The experts consider the provisionally set fee amount per micro-credential (module or postgraduate certificate course) to be realistic and a potentially significant source of income if the targeted enrolment numbers are achieved.

Final assessment of the peers after the comment of the Provider regarding criterion 3:

The experts reiterate their appreciation of commitment of the partner universities and the staff involved in providing these additional learning opportunities. As indicated in their preliminary evaluation, they are convinced that the human and material resources of the partner universities are sufficient to ensure the long-term delivery of the micro-credentials and the Postgraduate Certificate – provided that there is a sustained demand.

Otherwise, the delivery of the micro-credentials and the Postgraduate Certificate is directly connected with the delivery of the Joint Master’s programme. Consequently, the need to provide a convincing financial sustainability concept also pertains to the micro-credentials and the Postgraduate Certificate programme. Along with their statement to the accreditation report of the Joint Master’s programme, the universities have presented the revenue side of a financial sustainability concept, as was requested by the experts. However, the effort and the cost side are missing. Hence, the (more or less fixed) costs/efforts of the infrastructure and its continuous maintenance and the costs/efforts of teaching (depending to the number of students and adequate group sizes per module) must be addressed as well, both overall and per university (*see below, sec. F, requirement 5*).

Furthermore, referring to their argument in the reference accreditation report, the experts recommend incentivising and continually strengthening bonding activities of both learners and lecturers (*see below, sec. F, recommendation 2*).

The experts conclude that criterion 3 is partially fulfilled.

4. Quality Management: Monitoring and Continuous Improvement

Criterion 4 Quality assurance and enhancement

Cf. reference report Joint Master’s programme in Advanced Digital Technologies for Business, sec. 5.

5. Documentation and Transparency

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions
- Audit discussions

Preliminary assessment and analysis of the peers:

Cf. reference report Joint Master's programme in Advanced Digital Technologies for Business, sec. 4.1.

The existent module descriptions contain essential information and therefore can serve as a key information source for learners. However, as indicated in the reference report and again in this report, they are still considered insufficient in several cases (e.g. learning outcomes/reference to business-related problem-solving competences, teaching/learning formats and examination forms). Even more important in the present context is the fact that the micro-credentialing of a number of Joint Master's modules or combinations of them (Postgraduate Certificate Course) is hardly mentioned in the module descriptions. From the point of view of the experts, it is essential that the different uses of modules (as part of a Master's programme, as part of a Postgraduate Certificate course or as stand-alone modules) are also indicated and explained in some detail in the module descriptions.

Criterion 5.2 Relevant Documents

Evidence:

- "Conceptual Framework [...]", in particular chapter "Relevant rules", p. 8f.
- Audit discussions

Preliminary assessment and analysis of the peers:

The most serious neglect of the partner HEIs in relation to the micro-credentials is the absence of almost any information or document relating to the way in which the stand-alone modules and the Postgraduate Certificate course should be practically offered and implemented as micro-credentials. Without the audit discussions and the short conceptual framework document about the micro-credentials, their conceptual existence would have been gone largely unnoticed. Even if the modules are teaching/learning units taken from

an already designed programme and are not considered to be treated differently from the modules within the programme, it is by no means self-explanatory to learners interested in studying the micro-credentials how, for example, the enrolment in the modules or the Postgraduate Certificate course is handled. Similarly, without explicit reference, it remains unclear whether the assessment forms and grading criteria of the stand-alone modules are identical to those passed of the regular Master's programme.

Even more complicated in this context is the Postgraduate Certificate. For example, how would learners know at what point in time they need to decide on the combination of modules they would want to choose – before they start the course, after they have completed the *Digital Transformation* module, or at some point in between? How would they know if passing the regular assessments of the chosen modules would earn them the Postgraduate certificate, or if there were additional requirements to be met? What would the certificate look like? And what would the certificate look like if one of the stand-alone modules was passed as a micro-credential?

While the intention of the partner institutions to provide additional study options by way of micro-credentialing parts of the Joint Master's programme is highly respectable, the consequences for a transparent and consistent regulatory framework need to be carefully considered. In addition, potential learners need to be fully informed about the role that the micro-credentials can play, either as "stackable" parts of a full (Master's) programme, or as an exit route for learners, who are considering leaving the Master's programme.

If the rules for the admission, progression, assessment, and completion of the micro-credentials are not different from those concerning for the same modules in the Master's programme, this needs to be made clear and transparent. This would be all the more important if micro-credentials had to be treated differently. Rules that are unambiguous and transparently communicated to all relevant stakeholders can be established within the existing regulatory framework of the Master's programme or laid down in a separate document. They could be clearly set out in the Student Handbook alongside the information on the Master's programme, or in a separate leaflet, they could be published on the Joint Master's website or independently. Whatever solution is adopted by the partner institutions will be worthwhile as long as it serves the purpose of both clarity and transparency about the flexibility and variety of study options available.

Final assessment of the peers after the comment of the Provider regarding criterion 5:

It is positively noted that the D4B consortium plans to provide a clear institutional and regulatory framework for the micro-credentials and the Postgraduate Certificate course and

to ensure that this is appropriately reflected in all official documents. As this remains to be demonstrated, it is captured in related requirements (*see below, sec. F, requirements 6, 7, and 8*).

D Additional Documents

No additional documents needed.

E Comment of the Digital4Business Partner HEIs (19.08.2024)

The D4B consortium provided a short summary of comments on the different parts of this report. This includes – as an annex – a paper on the “Sustainability Strategy” that the consortium intends to follow in order to maintain and further develop, in particular, the Joint Master’s programme (and thus the modules and Postgraduate Certificate course) beyond the ESSA project period.

As for the experts’ preliminary judgement, the final judgement should be read in conjunction with the accreditation report of the Joint Master’s programme in Advanced Digital Technologies in Business.

F Summary: Peer recommendations (05.09.2024)

Taking into account the additional information and the comments given by the D4B consortium, the experts summarize their analysis and **final assessment** for the award of the ASIIN certificate as follows:

| Course/Modules | ASIIN Certificate | Maximum duration of certification | Alignment to a Qualification Framework Level |
|--|--|-----------------------------------|--|
| Postgraduate Certificate Course in Advanced Digital Skills | Awarded with requirements for one year | 30.09.2029 | Level 7 |
| Modules _ Digital Transformation _ AI for Business _ Data Science for Business _ Cyber Security for Business _ Cloud Computing for Business | Awarded with requirements for one year | 30.09.2029 | Level 7 |

Requirements

For all Micro-credentials (modules and Postgraduate Certificate course)

- A 1. (ASIIN 1.1, 1.2, 5.1) Clearly indicate the reference to solving business problems, including relevant methodologies, in the learning outcomes and contents of the modules.
- A 2. (ASIIN 1.4) Specify the technical and scientific prerequisites of the individual modules in order to contribute to and to facilitate the enrolment of suitable applicants.
- A 3. (ASIIN 1.5) Given the European background of the consortium, provide a coherent organizational/semester plan for the micro-credentials, including a consistent overview of the workload distribution for each one.
- A 4. (ASIIN 1.5) Ensure a systematic and regular monitoring of the credit point allocation in order to identify and, if necessary, adapt the credit point allocation or the contents of the modules.

- A 5. (ASIIN 3.3) Provide the concretized financial sustainability concept and the means for its implementation.
- A 6. (ASIIN 5.1) Revise and, if necessary, adapt the module descriptions according to the annotations in the report (e.g. learning outcomes, teaching/learning formats, examination forms, and relevant information about its delivery as a micro-credential).
- A 7. (ASIIN 5.2) Formulate and publish the rules and regulations pertaining to the admission, progression, examination, and completion of the micro-credentials and the Postgraduate Certificate.
- A 8. (ASIIN 5.2) Make all study-related information material and regulations concerning the micro-credentials and the Postgraduate Certificate available for the relevant stakeholders. At the same time, clarify the institutional framework of these study offers.

For the Postgraduate Certificate course

- A9. (ASIIN 1.1) Concretize the learning outcomes of the course considering the diverse module combinations and make them accessible to all relevant stakeholders.

Recommendations

For all Micro-credentials (modules and Postgraduate Certificate course)

- E 1. (ASIIN 1.4) Given the heterogeneous educational background of the applicants, it is recommended to make proper use of the already existing boot camps in case of knowledge gaps.
- E 2. (ASIIN 3.2) It is recommended to incentivise and continually strengthen bonding activities of both learners and lecturers.

G Decision of the Certification Commission (20.09.2024)

Assessment and analysis for the award of the ASIIN Certificate:

The Certification Commission discusses the procedure and follows the proposed resolution by the experts without changes.

The Certification Commission decides to award the ASIIN certificate as follows:

| Course/Modules | ASIIN Certificate | Maximum duration of certification | Alignment to a Qualification Framework Level |
|--|--|--|---|
| Postgraduate Certificate Course in Advanced Digital Skills | Awarded with requirements for one year | 30.09.2029 | Level 7 |
| Modules _ Digital Transformation _ AI for Business _ Data Science for Business _ Cyber Security for Business _ Cloud Computing for Business | Awarded with requirements for one year | 30.09.2029 | Level 7 |

Requirements

For all Micro-credentials (modules and Postgraduate Certificate course)

- A 1. (ASIIN 1.1, 1.2, 5.1) Clearly indicate the reference to solving business problems, including relevant methodologies, in the learning outcomes and contents of the modules.
- A 2. (ASIIN 1.4) Specify the technical and scientific prerequisites of the individual modules in order to contribute to and to facilitate the enrolment of suitable applicants.
- A 3. (ASIIN 1.5) Given the European background of the consortium, provide a coherent organizational/semester plan for the micro-credentials, including a consistent overview of the workload distribution for each one.

- A 4. (ASIIN 1.5) Ensure a systematic and regular monitoring of the credit point allocation in order to identify and, if necessary, adapt the credit point allocation or the contents of the modules.
- A 5. (ASIIN 3.3) Provide the concretized financial sustainability concept and the means for its implementation.
- A 6. (ASIIN 5.1) Revise and, if necessary, adapt the module descriptions according to the annotations in the report (e.g. learning outcomes, teaching/learning formats, examination forms, and relevant information about its delivery as a micro-credential).
- A 7. (ASIIN 5.2) Formulate and publish the rules and regulations pertaining to the admission, progression, examination, and completion of the micro-credentials and the Postgraduate Certificate.
- A 8. (ASIIN 5.2) Make all study-related information material and regulations concerning the micro-credentials and the Postgraduate Certificate available for the relevant stakeholders. At the same time, clarify the institutional framework of these study offers.

For the Postgraduate Certificate course

- A9. (ASIIN 1.1) Concretize the learning outcomes of the course considering the diverse module combinations and make them accessible to all relevant stakeholders.

Recommendations

For all Micro-credentials (modules and Postgraduate Certificate course)

- E 1. (ASIIN 1.4) Given the heterogeneous educational background of the applicants, it is recommended to make proper use of the already existing boot camps in case of knowledge gaps.
- E 2. (ASIIN 3.2) It is recommended to incentivise and continually strengthen bonding activities of both learners and lecturers.

H Fulfilment of Requirements

Analysis by the Expert Panel (30.11.2025)

Requirements

For all modules / Postgraduate Certificate Course

- A 1. (ASIIN 1.1, 1.2, 5.1) Clearly indicate the reference to solving business problems, including relevant methodologies, in the learning outcomes and contents of the modules.

| Initial Treatment | |
|-------------------|--|
| Experts | fulfilled <u>Justification:</u> The integration of business problem-solving methodologies into learning outcomes and module content is now considered satisfactory. The programme's technological foundation is deemed appropriate for addressing these concerns. |

- A 2. (ASIIN 1.4) Specify the technical and scientific prerequisites of the individual modules in order to contribute to and to facilitate the enrolment of suitable applicants.

| Initial Treatment | |
|-------------------|---|
| Experts | fulfilled <u>Justification:</u> The prerequisites are well detailed and the problem of heterogeneous or lacking technical skills of applicants has been solved sufficiently. |

- A 3. (ASIIN 1.5) Given the European background of the consortium, provide a coherent organizational/semester plan for the micro-credentials, including a consistent overview of the workload distribution for each one.

| Initial Treatment | |
|-------------------|---|
| Experts | fulfilled <u>Justification:</u> The partner universities have provided sufficient information about the semester planning of the micro-credentials and the Postgraduate Certificate. The experts have satisfied themselves of the timely scheduling and organisation of these learning units and of the adequate and transparent communication of the related information. |

- A 4. (ASIIN 1.5) Ensure a systematic and regular monitoring of the credit point allocation in order to identify and, if necessary, adapt the credit point allocation or the contents of the modules.

| Initial Treatment | |
|-------------------|---|
| Experts | <p>fulfilled</p> <p><u>Justification:</u> The issue is well addressed as surveys now ask whether the credits match the workload. However, concerns could be raised about how discrepancies in credit allocation are evaluated – students only assess compliance, without indicating whether deviations are upward or downward. A more quantitative approach could provide clearer insights.</p> |

- A 5. (ASIIN 3.3) Provide the concretized financial sustainability concept and the means for its implementation.

| Initial Treatment | |
|-------------------|---|
| Experts | <p>fulfilled</p> <p><u>Justification:</u> There remains some uncertainty about the financial sustainability of the study programme; the experts question the student numbers (e.g. 317 seems too high a number) and financial figures (9 million vs. 8 million in revenues). Yet, the experts believe that the current financial plan, which proves that the compendium receives 50% of the costs, is enough to carry the first cohort of students.</p> |

- A 6. (ASIIN 5.1) Revise and, if necessary, adapt the module descriptions according to the annotations in the report (e.g. learning outcomes, teaching/learning formats, examination forms, and relevant information about its delivery as a micro-credential).

| Initial Treatment | |
|-------------------|---|
| Experts | <p>fulfilled</p> <p>Vote: unanimous</p> <p><u>Justification:</u> The five modules relevant for the PGC and Micro-Credentials, respectively, have been compiled in a separate module handbook, which mentions the two terms (micro-credentials and Postgraduate Course) in the introductory section. The requirement is considered to be sufficiently fulfilled.</p> |

- A 7. (ASIIN 5.2) Formulate and publish the rules and regulations pertaining to the admission, progression, examination, and completion of the micro-credentials and the Postgraduate Certificate.

| Initial Treatment | |
|-------------------|---|
| Experts | fulfilled <u>Justification:</u> Rules and regulations pertaining to the admission, progression, examination, and completion of the <i>micro-credentials and the Postgraduate Certificate</i> have been published. The requirement is therefore considered to be fulfilled. |

- A 8. (ASIIN 5.2) Make all study-related information material and regulations concerning the micro-credentials and the Postgraduate Certificate available for the relevant stakeholders. At the same time, clarify the institutional framework of these study offers.

| Initial Treatment | |
|-------------------|--|
| Experts | fulfilled <u>Justification:</u> All study-related information material and regulations concerning the <i>micro-credentials and the Postgraduate Certificate</i> are made available for the relevant stakeholders. Efforts have been taken to also clarify the institutional framework of these study offers. The requirement is therefore considered to be fulfilled. |

For the Postgraduate Certificate course

- A 9. (ASIIN 1.1) Concretize the learning outcomes of the course considering the diverse module combinations and make them accessible to all relevant stakeholders.

| Initial Treatment | |
|-------------------|--|
| Experts | fulfilled <u>Justification:</u> The learning outcomes of the Postgraduate course with regard to the different module combinations on offer have been addressed in the study & exam regulations, pp 6 – 8. Otherwise, this document could still be improved, as the second relevant table is neither numbered nor does it have any title and there is another second table 1 on p. 10. Nevertheless, the requirement is considered to be fulfilled. It is recommended to revise the study & exam regulations to remove the identified deficiencies. |

Decision of the Certification Commission (16.12.2025)

The Certification Commission discusses the procedure and agrees with the assessment and judgment of the experts.

The Certification Commission decides to extend the validity of the certificates as follows:

| Course/Modules | ASIIN Certificate | Maximum duration of certification | Alignment to a Qualification Framework Level |
|--|----------------------------|-----------------------------------|--|
| Postgraduate Certificate Course in Advanced Digital Skills | All requirements fulfilled | 30.09.2029 | Level 7 |
| Modules _ Digital Transformation _ AI for Business _ Data Science for Business _ Cyber Security for Business _ Cloud Computing for Business | All requirements fulfilled | 30.09.2029 | Level 7 |

Furthermore, the Certification Commission decides to add to the following recommendation:

“It is recommended to revise the “Study and Examination Regulations for the Post-Graduate Certificate (PCG) and inherent Micro-Credentials” to remove the identified deficiencies (cf. comments on fulfilment of A 9).”