

# **Programme Validation Report**

## Postgraduate Certificate in Applied Data Science and Analytics

**Certificate in Applied Data Science and Analytics** 

## **Certificate in Applied Data Science and Text Analytics**

Five micro-credentials in Data Science and Cyber security: Algorithms for Data Science; Secure Programming; Application Security; Secure Communications and Cryptography; Digital Forensics

Version of Report	Author	Date
1.0	Gráinne Hurley	08/05/2024
		Click or tap to enter a date.
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Approval	Date	
Programme Proposal approved by Faculty Board	d 14/03/2024	
Programme Proposal approved by University Programmes Board	16/04/2024	
Programme approved by Faculty Board	Click or tap to enter a date.	
Programme approved by University Programmes Board	Click or tap to enter a date.	

**NOTE:** There are no new modules proposed for the awards. The School is seeking validation for the packaging of existing, validated modules into the three each minor award and five micro-credentials. Changes to policies in TU Dublin requires the four 10 credit special purpose awards to be revalidated as micro-credentials.

## Section A - Programme Details

Title	Postgraduate Certificate in Applied Data Science and Analytics	
	Certificate in Applied Data Science and Analytics	
	Certificate in Applied Data Science and Text Analytics	
	Five micro-credentials in Data Science and Cyber security:	
	Algorithms for Data Science;	
	Secure Programming;	
	Application Security;	
	Secure Communications and Cryptography;	
	Digital Forensics	

NFQ Level	9
NFQ Level ECTS Credits Mode of delivery Duration	9         Postgraduate Certificate in Applied Data Science and Analytics (30 credits)         Certificate in Applied Data Science and Analytics (20 credits)         Certificate in Applied Data Science and Text Analytics (20 credits)         Algorithms for Data Science (10 credits)         Secure Programming (10 credits)         Secure Programming (10 credits)         Secure Communications and Cryptography (10 credits)         Digital Forensics (10 credits)         Part-time         Part-time         Part-time         Certificate in Applied Data Science and time:         Analytics (1 Year)         Certificate in Applied Data         Science and Analytics (1         year)         Certificate in Applied Data         Science and Analytics (1         year)         Certificate in Applied Data         Science and Text Analytics         (1 year & 6 months)         Algorithms for Data Science         Secure Programming;         Application Security;         Secure Communications         and Cryptography;
Marda of marrising	Digital Forensics
Mode of provision	Face-to-Face   □   Blended ✓   Online ✓
Classification of award	School of Informatics and Cubar socurity
Discipline Programmes Board	School of Informatics and Cyber security
Faculty Board Schools involved in delivery	Faculty of Computing School of Informatics and Cyber security
Delivery location	Blanchardstown
Collaborative Partner (where applicable)	
Date of Commencement	September 2024

## Section B - Awards

Award Title	Postgraduate Certificate in Applied Data Science and Analytics	
NFQ Level	9	
Award Class	Minor	
ECTS Credits	30 credits	
Classification of award		
Award Title	Certificate in Applied Data Science and Analytics	
Exit/Embedded	Exit 🗌 Embedded 🗌	
NFQ Level	9	
Award Class	Minor	
ECTS Credits	20	
Classification of award		
Award	Certificate in Applied Data Science and Text Analytics	
Exit/Embedded	Exit 🗌 Embedded 🗌	
NFQ Level	9	
Award Class	Minor	
ECTS Credits	20	
Classification of award		
Award	Micro-credential	
	Algorithms for Data Science	
	Secure Programming	
	Application Security	
	Secure Communications and Cryptography	
	Digital Forensics	
Exit Award		
Exit/Embedded	Exit  Embedded	
NFQ Level	9	
Award Class	Special Purpose	
ECTS Credits	10	
Classification of award		

## Section C - Programme Derogations (if required)

Derogations from Assessment Regulations/Marks and Stan Programmes Board	dards already approved by University
N/A	
Date of University Programmes Board Approval	Click or tap to enter a date.

Section D Validation Process

Please tick the process that was followed:

Validation Panel 🗸	AQEC Meeting	AQEC Sub-Group
Date: 8 May 2024	Date:	Date:

**Panel Members** 

Name	Role	Affiliation	
Dr Ciarán O'Leary	Chair	Head of Learning	
		Development, Chairperson	
Andrew Chisholm	External Panel Member	Lecturer, University of	
		Chichester	
Dr Susan McKeever	Internal Panel Member	Head of Artificial Intelligence	
		and Data Science, School of	
		Computer Science	
Dr Carl Sullivan	Internal Panel Member	Head of Pure and Applied	
		Mathematics, School of	
		Mathematics and Statistics	
Dr Gráinne Hurley	Internal Panel Member	Quality Assurance Office	

#### **Section E - Programme Evaluation**

Governance & Management			
Is the programme designed in accordance with the University's	Yes ✓	No 🗆	
Strategic Plan, Educational Model and Quality Framework?			
Comment: These three minor awards and five micro-credentials address	s the three pill	ars of the TU	
Dublin Strategic Intent, as highlighted below:			
People: The School promotes a culture that inspires, supports and dev	elops staff and	d students in	
reaching their full potential. The programme educates students to confid	lently tackle th	ne challenges	
they may face in their future career and aims to foster a curiosity	for developin	g innovative	
solutions. These minor awards provide a more accessible offering in a k	ey skills area	and at a high	
level of challenge.			
Planet: Improving the sustainability of the planet requires data infor	med problem	solving and	
critical thinking, and secure, reliable IT solutions. Therefore, the School	places great ir	mportance in	
increasing the number of graduates with the skills to provide data in	formed, reliab	ole, unbiased	
solutions and to critically evaluate their processes and resulting models.	In addition, ar	n increasingly	
sophisticated threat landscape demands that higher education prov	sophisticated threat landscape demands that higher education provisions level 9 continuous		
professional development for experienced IT professionals. Data science and cyber security are			
both critical skills for this technology age, which will be highlighted by case studies and class			
discussions throughout all of the modules.			
Partnership: The proposed programmes are meeting an identified industry need for accessible			
education with short term time commitments that also upskills employed	es in data scien	ice and cyber	
security competencies. The inherent applied nature of these programme	es produces gr	aduates that	
are industry-focused and ready to add value to their organisation by combining profession-specific			
technical knowledge with analytic, numeric, communication, technical	and research	skills in the	

provision of critical thinking and reasoned problem solving. **TU Dublin's University Education Model**: A key pillar of the UEM is learning pathway and, in line with this pillar, these minor awards and micro-credentials increase the number of pathways for prospective students to achieve level 9 qualifications in applied data science and cyber security. 

Will the proposed strategies for programme management and quality assurance ensure that the programme is well managed and continuously enhanced and is in accordance with the University's Quality Framework?	Yes ✓	No 🗆
Comment: The Quality Framework is designed to support all of the university's a provide robust processes to assure the quality of its awards and nurt attributes. TU Dublin has developed <u>Quality Assurance and Enhanceme</u> staff to continuously improve the TU Dublin Student Experience and Quality Culture. This processes are underpinned by the University's <u>Aca</u> <u>Principles</u>	ure the essent ent Processes to d enhance the	tial graduate hat supports University's

Awards Standards		
Are the programme aims and learning outcomes clearly written using appropriate terminology? (See TU Dublin Guidelines)	Yes 🗆	No ✓
Comment: The programme learning outcomes need to be rewritten for more clarity updated.	and reference	es need to be
Are the programme aims and learning outcomes aligned to the proposed level of the award on the NFQ in accordance with applicable Award Standards?	Yes ✓	No
Comment:		
Will the curricula, teaching, learning and assessment methods enable students to reach the appropriate standard to qualify for the award(s)?	Yes ✓	No 🗆
A variety of teaching and learning methods are employed across module and recordings of all lectures, additional case students and peer review Learning Environments, online support, literature reviews, work-based p All modules are 100% CA, allowing flexibility for students to gain an in dep relevant to their work contexts. Students are made aware of all int assessments including the criteria by which they are graded. Detailed, in on all submissions. In keeping with the terms of the TU Dublin Stude provided with a schedule of assignments for each module in the first the semester. By using assessment schedules, the programme team can re- students and spread the coursework across a number of weeks to avoid workload. There are also several resources on the TU Dublin website for <i>Was the programme development appropriately informed by internal</i>	wed papers vi rojects, and gu oth understand formation rele ndividual feed dent Charter wo weeks of t eview the wor congestion in r all stakeholde	a the Virtual uest lectures. d of methods evant to the back is given students are he academic kload of the o the student
and external stakeholder input (including industry/practice, professional/regulatory bodies, and community organisations)?		
Comment: The School developed the certificates and micro-credentials in direct reshighlighted a need to upskill employees in the areas of data science and there are noticeable skill shortages, via shorter level 9 programmes while the student. The School, cognisant of these demands, developed micro-the MSC in Applied Data Science and Analytics. The School was successful which will fund 80% of the fees for successful applicants of three minor credential that are constituents of the MSc in Applied Data Science and	cyber security Ist giving more credentials de ul in securing awards and or	y, where flexibility to rived from HEA funding

Has the programme been benchmarked against similar programmes nationally and internationally?	Yes ✓	No 🗆
Comment:		
Did the programme development take account of relevant external discipline benchmarks and Professional Statutory and Regulatory Body requirements?	Yes ✓	No 🗆
Comment:	·	

Programme Design		
Is the programme design informed by current development in the	Yes 🗸	No 🗆
discipline and associated subject areas, having taken into consideration		
current trends, stakeholder feedback and market analysis?		
Comment:		
The School responded to the growing demand from employers to addre	ss skills shorta	ages in the
areas of cyber security and data science and for shorter level 9 program	mes. In addition	on, it
recognised professionals' need for flexibility, focus and a more 'hands-o	n', practical a	oproach.
The School's use of Mercer Mettl (online assessment platform that allow	vs for remote	learners to
undertake class test online) and their 'hands-on' approach demonstrate	s their commi	tment to
facilitating this particular cohort of students. The School has agreement	s with Workda	iy and
Orange to offer four 10-credit special purpose awards based on module	s on the MSc i	n Applied
Cyber security (changes to policies in TU Dublin requires the four 10 cre	dit special pur	pose awards
to be re-validated as micro-credentials). The programmes are designed	for students ir	n the
workplace who need to upskill or reskill in data science and cyber securi	•	
increased their support for these specific programmes reflects the pred	-	emand in
this area, and the relevance of these minor awards to meet industry nee	eds.	1
	Yes 🗸	No 🗆
decisions in the future?		
Comment:		
The TU Dublin Quality Assurance & Enhancement policies and procedures for all TU Dublin		
programmes include both a student feedback mechanism for individual modules and a		
requirement for student representation at all boards and committees governing the programme.		
Supports are also made available to both staff and students regarding ways in which the Student		
Voice can be used at all stages of programme design. <u>https://www.tudublin.ie/explore/about-the-</u>		
university/academic-affairs/our-student-voice/		
Is there a mechanism to ensure the input of external stakeholders in the	Yes 🗸	No 🗆
ongoing development of the programme?		
Comment:		
The School has forged impressive links and relationships with industry a		consults with
various external stakeholders in order to identify and fulfil their demand		
Is the programme curriculum well-structured with a logical progression	Yes ✓	No 🗆
of learning and development across the modules and stages?		

Are there appropriate opportunities for students to undertake work-	Yes 🗸	No 🗆
based learning, through work placements or work-based projects or		
assignments?		
Students employ datasets from their own workplaces in many instances	5.	
If applicable, have the relevant Blended Learning Checklists (i.e.	Yes 🗆	No 🗆
Learning Experience Context & Programme Context) been fully		
completed and submitted to the Panel?		
Comment:		
Is the required programme and module information provided in the	Yes ✓	No 🗆
correct format?		
Comment:		

Learning, Teaching & Assessment		
Is there an effective student-centred teaching and learning strategy	Yes ✓	No 🗆
that aligns with the University's strategies and Education Model?		
Comment:		
Does the assessment strategy provide an appropriate mix of	Yes 🗸	No 🗆
assessment types that will enable students to demonstrate that they		
have met the module and programme learning outcomes?		
Comment:		
Do the learning outcomes and assessment strategy ensure that	Yes ✓	No 🗆
academic integrity can be maintained and attempted breaches of		
academic integrity are minimised/easily detected?		
Comment:		
An Epigeum training module on Academic Integrity, developed for stude	nts, is availabl	e on all of TU
Dublin's VLE instances. Academic integrity is critical to the reputation of	higher educati	on, including
the recognition of the 15 Postgraduate Certificate in Applied Data Science	e and Analytic	s; Certificate
in Applied Data Science and Analytics; Certificate in Applied Data S	cience and Te	ext Analytics
graduate's academic learning and qualifications. It can be defined as "co	ompliance wit	h ethical and
professional principles, standards, practices and consistent system		
guidance for making decisions and taking actions in education, research a	and scholarshi	o" as defined
by Quality and Qualifications Ireland.		
Is there a comprehensive mapping of assessment methods and module	Yes 🗆	No ✓
learning outcomes and between module learning outcomes and		
programme learning outcomes?		
Comment:		
The panel advised that programme learning outcomes should be ma	apped to mod	dule learning
outcomes.		
Are there opportunities in all modules to provide students with timely	Yes 🗸	No 🗆
and constructive feedback on their learning and development?		
Timely feedback is provided on all assessments in order that students c	an identify are	eas that have
been completed satisfactorily and clearly know which sections require f	further study.	Students can
expect the return of marked assignments with feedback within two w	veeks. All feed	lback will be
designed to achieve its intended purpose.		
• summative - providing an accurate judgement and record of a student	's attainment;	
<ul> <li>formative - helping a student to learn from previous performance in o</li> </ul>	rder to improv	/e;

<ul> <li>diagnostic - ascertaining students' strengths, learning or developmental needs.</li> </ul>		
Each module leader is responsible for the type and approach taken to feedback. The vast majority		vast majority
of personalised feedback is provided through the VLE. Here, lecturers	can commen	t, grade and
provide detailed feedback which can be made available to the students to view online. Generalised		
feedback is also given during scheduled classes.		
Do the teaching and assessment methods consider the diversity of the $ $ Yes $\checkmark$ $ $ No $\Box$		
student cohort?		
Comment:		

Student Supports & Learning Environment		
Are there sufficient and appropriate resources (e.g. human, financial	Yes ✓	No 🗆
and physical) to support the proposed programme aims and objectives,		
to deliver the programme as specified?		
Comment:		
As these awards will be offered online, induction and orientation are con	nducted asyncl	nronously via
emails to students prior to commencing on the programme, and a det	ailed student l	nandbook on
how to get started. Staff are also on hand to meet students online and a	ddress any iss	ues they may
have. All lectures are delivered live and are recorded. The University	has a dedicate	ed LTA team
which works closely with academic staff to bring a commitment of resea	rch-informed	teaching that
promotes a programme-based culture and helps to create a quality in	clusive learnin	g experience
for all our students. In addition, the Faculty's Head of Learning Developm	ent organises	regular lunch
time symposiums on examples of good teaching and learning practic	e happening i	n across the
faculty, covering themes such as AI in the classroom, creative coding,	-	-
our programmes, incorporating soft skills in a technical programme and	many more. Re	ecordings are
available on the Faculty's intranet. A range of technologies are use		-
teaching and the Virtual Learning Environment (VLE) forms a core compo	onent of all mo	dule delivery
in terms of provision of notes, supporting reading and reference ma	aterials, discus	sion boards,
assessment and feedback.		1
Are there sufficient staff that are appropriately qualified and capable to	Yes 🗸	
support the programme delivery, from both context and pedagogy		
perspectives?		
The programme team staff are engaged in a wide range of researc		
reviewed conferences, journals and industry-related research reports and guidance notes. Staff		
members are also actively involved in a range of scientific committees for international journals and		
conferences. Members of the team have successfully competed for research funding and are		
involved in a range of strategically important research initiatives in online safety, malware analysis,		
fraud detection, cellular network security, internet of things, computer		
learning analytics, Education & IT, GIS and High Performance Compu		
outputs are accessible through the university repository, Arrow, and	on staff's Go	ogle Scholar
pages.		
Are there appropriate arrangements in place to support the student	Yes 🗸	No 🗆
experience and to monitor student performance?	<u> </u>	
Comment:		
As these awards will be offered online, induction and orientation are con		
emails to students prior to commencing on the programme, and a detailed student handbook on		
how to get started. Staff are also on hand to meet students online and address any issues they may		
have.		
Timely feedback is provided on all assessments in order that students of	an identify are	eas that have

Timely feedback is provided on all assessments in order that students can identify areas that have been completed satisfactorily and clearly know which sections require further study. Students can

expect the return of marked assignments with feedback within two weeks. All feedback will be designed to achieve its intended purpose:

• summative - providing an accurate judgement and record of a student's attainment;

• formative - helping a student to learn from previous performance in order to improve;

• diagnostic - ascertaining students' strengths, learning or developmental needs.

Each module leader is responsible for the type and approach taken to feedback. The vast majority of personalised feedback is provided through the VLE. Here, lecturers can comment, grade and provide detailed feedback which can be made available to the students to view online. Generalised feedback is also given during scheduled classes

Are the access, transfer and progression arrangements clearly defined	Yes 🗸	No 🗆
and appropriate, and aligned to TU Dublin policy/strategy in this		
regard?		

Comment:

Admission is through a portal on the HEA website. Direct applications to TU Dublin can also be accepted, but these will not be eligible for HEA funding. The minimum entry requirement is a Second Class Honours Grade 2 (GPA 2.5 or equivalent), in a NFQ Level 8 Degree. For Cyber security, their degree must be in Computing or equivalent. For Data Science, applicants from Engineering, Business with IT, or equivalent numerate degrees are also eligible. The acceptance of candidates with Third Class Honours degrees and appropriate work experience and industrial certification on this course will be allowed provided there is evidence that the candidate can cope with the learning objectives of the course. RPL (recognition of prior learning) applicants will also be considered where RPL applications are submitted in sufficient time for evaluation as being equivalent to a level 8 award.

Do the student supports and learning environment cater for equality,	Yes 🗸	No 🗆
diversity and inclusivity of students?		

Comment:

A core element of the TU Dublin Strategic Intent is equality and diversity across all stakeholders and TU Dublin has a Directorate of Equality, Diversity, and Inclusion with responsibility for the development of strategy, policies and practices across the university (see TU Dublin Equality and Diversity). The programme is aligned to this strategy in its commitment to fostering and ensuring equality and diversity. The aim is to be inclusive in all aspects of the programme and to create a welcoming atmosphere in which students can study and grow while maintaining individuality.

Is the relevant programme information clearly communicated to the	Yes ✓	No 🗆
students to ensure they are informed, guided and cared for?		
Comment:		
Has the Checklist for First Year Student Success (where applicable) been	Yes 🗆	No 🗆
fully completed and submitted to the Panel?		
Comment:		

Collaborative Provision (if applicable)		
Are the roles and responsibilities of each partner clearly defined?	Yes 🗆	No 🗆
N/A		
	T	1
In the case of Joint or Multiple Awards, has due diligence on capacity of	Yes 🗆	No 🗆
partner institution meeting the QA-QE requirements for the programme		
been undertaken?		
N/A		

# Section F - Overall Recommendation

1.	Recommend approval of programme as submitted, without amendment	
2.	Recommend approval of programme, subject to minor amendments/editorial	
	changes to be completed as soon as possible and with recommendations for	
	consideration.	
	<b>Note:</b> recommendations are attached where it is considered that the programme would benefit from particular changes, or from a review of certain aspects of the programme over a period of time, with changes made if required. While recommendations are advisory in nature, there is an expectation that all recommendations are responded to appropriately and acted upon as appropriate.	
3.	Recommend approval of programme subject to the fulfilment of conditions.	$\boxtimes$
	Recommendations for consideration may also be attached.	
	<b>Note:</b> conditions are attached where it is agreed that changes must be made to the programme / programme documentation prior to the commencement of the programme. Conditions must be set where issues are identified that relate directly to academic standards or to University regulations or procedures. It should be clear what is required in order to meet the conditions.	
	A new programme cannot go forward to Faculty Board for consideration/approval unless a response to the Validation Report is submitted with revised programme documentation and the Academic Quality Enhancement Committee is satisfied that all conditions are met.	
4.	Do not recommend approval of programme.	

Areas	Areas for commendation		
1.	The panel commends the School for engaging with and embracing the new micro- credentials policy.		
2.	The panel recognises the School's impressive engagement with industry and its responsiveness to its needs.		
3.	The panel were impressed with the School's use of datasets and the embedding of the students' professions in the programme implementation.		
4.	The panel commends the practical 'hands-on' approach.		
5.	The panel commends the use of Mercer Mettl (online assessment platform) to facilitate class tests for remote learners.		

Cor	nditions of Approval
1.	The Learning outcomes need to be mapped to the assessments in all cases. There are some cases where learning outcomes are not correctly mapped to the assessment strategy for the module. Response: We addressed this in the program documentation, all modules were updated as required.
2.	The learning hours need to be correctly recorded in Akari. In some cases, learning hours are given per week and in other cases they are given per module. The latter approach is the correct one. Response: We updated this in the program documentation, all learning hours are by module.
3.	Programme Learning outcomes need to be rewritten to be consistent with the required style and structure for learning outcomes. While the panel is satisfied that the Programme Learning Outcomes are at the correct level, not all programme learning outcomes are correctly structured to clearly communicate what is expected of the learner. Response: We addressed this in the program documentation.
4.	<ul> <li>Award classifications need to be provided. The School needs to clarify whether it is intended that awards will be classified. The School should consult with Academic Affairs to ensure that any proposal in this regard is consistent with University policy.</li> <li>Response: We added the award classification to the documentation. Pass, Merit and Distinction with the following calculations: <ul> <li>Pass: GPA of 2.00</li> <li>Merit: GPA of 3.00</li> <li>Distinction: GPA of 3.25</li> </ul> </li> </ul>

## Recommendations

 The panel recommends that the School does a 'sanity check' of modules before they go live on the TU Dublin website. While recognising that modules have been written in the past and at that time, they were written for internal quality assurance purposes, the use of module information on public websites as part of a high profile recruitment campaign for microcredentials may require that some elements of module descriptors should be updated. The panel accepts that all module descriptors for the Masters programmes from which the modules for these minor awards were taken will be reviewed as part of the upcoming reviews of the Masters programmes in the next academic year.
 Response: We reviewed all modules that are part of this validation and ensured they are up-

to-date, relevant and complete. We also made changes to the reading list where required.

2.	The panel recommends that the School should include reference to the use of structured
	data in the Algorithms for Data Science module and micro-credential.
	Response: We added this to the module description. All data, even when originating from
	unstructured data, must be in structured format prior to being processed by the algorithms.
3.	The panel recommends that the School provide additional sections to the Student
	Handbook to cover certificates and micro-credentials.
	Response: This will be in place prior to the rollout of the programs.

Other matters to be brought to the attention of Faculty Board and/or University Programm	
Board	
	Î

## Section G - Approvals

Validation Report				
This report has been agreed by the Validation Panel and is signed on their behalf by the				
chairperson.				
Chairperson: Dr Ciarán O'Leary				
Ciava Day Signed:	Date: 17/05/2024			

School Response				
The response to the conditions and recommendations has been agreed by the School and is signed by the Head of School.				
Head of School: Dr Geraldine Gray				
Signed: Geraldine Grang	Date: 07/06/2024			

Faculty Board				
The report and response have been approved by Faculty Board				
Vice-Dean for Education:				
Signed:	Date: 20/06/2024			

University Programmes Board (Programmes of 30 ECTS or great) The report and response have been approved by the University Programmes Board		
Signed:	Date: Click or tap to enter a date.	