

Programme Review Report

Bachelor of Science (Honours) in Computing (Information Technology)

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Bachelor of Science (Honours) in Computing in Digital Forensics and Cyber Security

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Bachelor of Science in Computing in Secure Networking and Cloud Technologies

Version of Report	Author	Date
1.0	Gráinne Hurley	11/06/2024
		Click or tap to enter a date.
		Click or tap to enter a date.

Approval	Date
Documentation for Review approved by Faculty Board	28/09/2023
Report of Programme Review Panel approved by AQAEC	19/03/2024
New Programme Title approved by University Programmes Board	Click or tap to enter a date.
(if applicable)	

Important Note:

This report combines the three programmes under review due to the fact that there is much commonality and overlap in the School's enhancement and restructuring of the programmes, as briefly highlighted below:

- TU757, TU860, TU758, and TU863 share a common year 1 (Bachelor of Science (Honours) in Computing (Information Technology) & Bachelor of Science (Honours) in Computing in Digital Forensics and Cyber Security)
- BSc in Computing (Information Technology) and BSc in Computing in Digital Forensics and Cyber Security split after year 1, instead of year 2;
- balancing of 5 and 10 credit modules in each semester to reduce workload and assessments;
- mapping of the programmes to UEM and Sustainability;
- Introduction of a work placement in semester 6.
- Restructuring of year 4 modules, with additional electives, to allow for specialisations.

As a result, the panel agreed that one report was appropriate, given that its commendations, conditions and recommendations were generally applicable to each of the programmes, unless otherwise specified.

The BSc in Computing in Secure Networking and Cloud Technologies is the combination of two existing programmes, Higher Certificate in Computing in Networking Technologies (Learn & Work L6) & the add-on Bachelor of Science in Computing in Cloud Networking Technologies (L7). Combining these two programmes allows for a level 7 offering on the CAO.

Section A Progra	mme Details		
Title	Bachelor of Science (Honours) in Computing (Information Technology) TU860		
NFQ Level	8		
ECTS Credits	240		
Mode of delivery	Part-time \square		Full-time ✓
Duration	Part-time:		Full-time: 4 Years
Modality/ies of delivery	In-person, On- Blended □ campus ✓		
	Online 🗆	Hyfle	k □
Classification of award	Classification	GPA Required	Indicative Description
	Pass	2.00	Attains all the minimum intended programme learning outcomes
	Second Class Honours Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects
	Second Class Honours, Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects
	First Class Honours	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respects
Discipline Programmes Board	Informatics & Cybe	ersecurity	
Faculty Board	Faculty of Comput	ing	
Schools involved in delivery	Informatics & Cybersecurity		
Delivery location	Blanchardstown Campus		
Collaborative Partner (where applicable)	N/A		
Date of Commencement of revised programme	September 2024		

Section B Awards			
Award Title	Bachelor of Science (Honours) in Computing (Information Technology)		
NFQ Level	8		
Award Class	Major		
ECTS Credits	240		
Classification of award	Classification	GPA Required	Indicative Description
	Pass	2.00	Attains all the minimum intended programme learning outcomes
	Second Class Honours Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects
	Second Class Honours, Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects
	First Class Honours	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respec
Award (1) Title	Bachelor of Science	e in Comp	uting (Information Technology) TU757
Exit/Embedded	Exit 🗵		embedded 🖂
NNFQ Level	7		
Award Class	Major		
ECTS Credits	180		
Classification of award			

			_
	Classification	GPA Required	Indicative Description
	Pass	2.00	Attains all the minimum intended programme learning outcomes
	Merit Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects
	Mert Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects
	Distinction	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respects
Award (2) Title		=	s) in Computing (Information Technology)
	TU883 (add-on h	· · · · · ·	·
Exit/Embedded	Exit ⊠	(embedded 🖂
NNFQ Level	8		
Award Class	Major		
ECTS Credits	60		
Classification of award	Classification	GPA Required	Indicative Description
	Pass		Attains all the minimum intended programme learning outcomes
	Second Class Honours Grade 2		Pass and achievement is significantly beyond pass standard in some respects
	Second Class Honours, Grade		Pass and achievement is significantly beyond pass standard in many respects
	First Class Honours	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respec
Award (3) Title	(TU653)		in Computing in Information Technology ut retained as exit award for TU757 and
Exit/Embedded	Exit 🖂		embedded 🗆
NNFQ Level	6		
Award Class	Major		
ECTS Credits	120		
Classification of award			
	Classification	GPA Required	Indicative Description
	Pass	2.00	Attains all the minimum intended programme learning outcomes
	Merit Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects
	Mert Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects
	Distinction	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respects
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Section A	Programme D	etails			
Title	Bachelor of Science (Honours) in Computing in Applied Cybersecurity and Digital				
	Forensics (TU863)				
	(the former title was Bachelor of Science (Honours) in Computing in Digital Forensics				
	and Cyber Security				
NFQ Level	8				
ECTS Credits	240				
Mode of delivery	Part-time ✓		Full-time ✓		
Duration	Part-time:		Full-time: 4	Years	
Modality/ies of delivery	In-person, On-can	npus √	Blended ✓		
uelivery	Online □		I la flava		
	Online 🗆		Hyflex □		
Classification of	Classification	GPA	Indicative Description		
award	Dage	Required 2.00	Attains all the minimum intended programme	4	
	Pass	2.00	Attains all the minimum intended programme learning outcomes		
	Second Class	2.50	Pass and achievement is significantly beyond		
	Honours Grade 2	2.00	pass standard in some respects	4	
	Second Class Honours, Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects		
	First Class	3.25	Pass and achievement is significantly and	1	
	Honours		consistently beyond pass standard in most		
Disciplina	Information 9 Out		respects		
Discipline Programmes	Informatics & Cybersecurity				
Board					
Faculty Board	Faculty of Compu	ting			
Schools involved	Informatics & Cyb				
in delivery		0.0000	,		
Delivery location	Blanchardstown C	Campus			
Collaborative	NA				
Partner (where					
applicable)					
Date of	September 2024				
Commencement					
of revised					
programme					
Section B	Awards	(1.1); A !: 10 ! .: .: .: .: .: .:		
Award Title	Bachelor of Science	e (Honou	ırs) in Applied Cybersecurity and Digital For	ensics	

NFQ Level	8				
Award Class	Major				
ECTS Credits	240				
Classification of award	Classification GPA Required		Indicative Description		
awara			Attains all the minimum intended programme learning outcomes		
	Second Class Honours Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects		
	Second Class Honours, Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects		
	First Class Honours	3.25	Pass and achievement is significantly and consistently beyond pass standard in most		
			respects		
Award (1) Title	Bachelor of Scien	nce in App	lied Cybersecurity and Digital Forensics		
Exit/Embedded	Exit 🗵		embedded ⊠		
NNFQ Level	7				
Award Class	Major				
ECTS Credits	180				
Classification of				7	
award	1 1	GPA Required	Indicative Description		
	Pass 2	2.00	Attains all the minimum intended programme learning outcomes		
	Merit Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects		
	Mert Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects		
	Distinction	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respects		
Award (2) Title	Bachelor of Science in Computing in Digital Forensics & Cyber Security				
Exit/Embedded	Exit		embedded □		
NNFQ Level	7				
Award Class	Major				
ECTS Credits	60				
Classification of award	1 1	GPA Required	Indicative Description		
awaiu		2.00	Attains all the minimum intended programme learning outcomes		
	Merit Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects		
	Mert Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects		
	Distinction	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respects		
Award (3) Title	Bachelor of Science (Honours) in Applied Cybersecurity and Digital Forensics				

Exit/Embedded	Exit		embedded ⊠		
NNFQ Level	8				
Award Class	Major				
ECTS Credits	60				
Classification of award					
Award (4) Title	_		n Computing in Information Technology (TU653) t retained as exit award for TU757 and TU860)		
Exit/Embedded	Exit	\boxtimes	embedded \square		
NNFQ Level	6				
Award Class	Major				
ECTS Credits	120				
Classification of					
award	Classification	GPA Required	Indicative Description		
	Pass	2.00	Attains all the minimum intended programme learning outcomes		
	Merit Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects		
	Mert Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects		
	Distinction	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respects		

Section A	Programm	e Details		
Title	TU7xx: B.Sc. in Computing in Secure Networking and Cloud Technologies			
	(combination of the existing Higher Certificate in Computing in Networking			
	Technologies (L	6) & Bachelor	of Science in Computing in Cloud Networking	
	Technologies)			
NFQ Level	7			
ECTS Credits	180			
Mode of delivery	Part-time \square		Full-time ✓	
Duration	Part-time:		Full-time: 3 Years	
Modality/ies of	In-person, On-	Bler	nded 🗆	
delivery	campus \square			
	Online \square	Hyf	ex 🗆	
Classification of	Classification	GPA	Indicative Description	
award	Pass	Required 2.00	Attains all the minimum intended programme	
	1 433		learning outcomes	
	Merit Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects	
	Mert Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects	
	Distinction	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respects	
		•		
Discipline	Informatics & Co	ybersecurity		
Programmes				
Board				

Faculty Board	Faculty of Computing
Schools involved	Informatics & Cybersecurity
in delivery	
Delivery location	Blanchardstown Campus
Collaborative	N/A
Partner (where	
applicable)	
Date of	September 2025
Commencement	
of revised	
programme	

Section B	Awards		
Award Title	Bachelor of Scie	ence in Comp	uting in Secure Networking and Cloud
	Technologies		
NFQ Level	7		
Award Class	Major		
ECTS Credits	180		
Classification of award	Classification	GPA Required	Indicative Description
awara	Pass	2.00	Attains all the minimum intended programme learning outcomes
	Merit Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects
	Mert Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects
	Distinction	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respects
Award (1) Title	Higher Certificate in Science in Computing in Secure Networking Technologies		
Exit/Embedded	Exit 🗵	3	embedded 🖂
NNFQ Level	6		
Award Class	Major		
ECTS Credits	120		
Classification of award	Classification	GPA Required	Indicative Description
awaru	Pass	2.00	Attains all the minimum intended programme learning outcomes
	Merit Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects
	Mert Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects
	Distinction	3.25	Pass and achievement is significantly and consistently beyond pass standard in most respects
Award (2) Title	Bachelor of Scie	ence in Comp	uting in Cloud Networking Technologies
Exit/Embedded	Exit		
NNFQ Level	7		
Award Class	Major		
ECTS Credits	60		
Classification of			
award			
Section C - Progra	amme Derogati	ons (if requi	ired)

Derogations from Assessment Regulations/Marks and Standards, requiring approval by University			
Programmes Board			
University Programmes Board Approval	Date		

Section D Review	Process
Date of Programme Review	31 May 2024

Context for Programme Review How was the programme review process instigated, by whom/via which process? The Programme Review was instigated by the School.

Please tick the type of programme review undertaken:

Full Programme Review ✓ Focused Programme Review □		Focused Programme Review	
	If a focused programme review, what is/are the area(s) of focus?		
	N/A		

Transitional arrangements

How will changes to revised programme be implemented, i.e. to be implemented with immediate effect in the next academic year of delivery, or phased in on a year-by-year basis.

Phased in on a year-by-year basis

Panel Members

Name	Role		Affiliation	
Dr Jan Guerin	Chair		Head of Discipline, Medical Science (TU Dublin)	
Dr Nigel Vahey	Internal panel member		Lecturer, School of Social Sciences, Law, and Education (TU Dublin)	
Dr Hazel Murray	External panel member		Cyber Security Lecturer (Munster Technological University)	
Dr Enda Fallon	External panel member		Head of Department of Computer and Software Engineering (Technological University of the Shannon, Athlone Campus)	
Christina Quinn	External panel member		Technical Consultant - Cyber Security Manager (Ernst & Young)	
Andrew Penrose	External panel member		STSM, Data AI & Sustainability (IBM)	
Dr Gráinne Hurley	Academic Representative	Affairs	Academic Affairs Representative (TU Dublin)	

Schedule of Meetings

09:00-09:00	Panel introductions
09:05-09.30	Presentation by School
09:30-10:30	Private meeting of panel
10:30-10:45	Break
10.45-12:00	Meeting with School Management and Programme Leadership Team

12:00-12.15	Break
12.15-13:00	Meeting with Student Representatives
13:00-13.45	Panel lunch
13:45-15:45	Meeting with Teaching Team
15:45-16:45	Private meeting of panel to discuss outcome
16:45	Verbal report to School
17:00	Close

Section E Programme Evaluation

Programme Review Process		
Was the programme review conducted in accordance with the Programme Review Process, i.e. were current students, graduates, employers, other appropriate stakeholders involved in the review process?	Yes ✓	No □
Comment: The School had proactively engaged with a range of stake	holders, in pa	rticular with
industry and students, and it was evident that their feedback actively i	nformed the i	eview of the
programme. In addition, the panel was provided with extensive docume	entation.	
Governance & Management		
Does the programme align with the University's Strategic Plan and the principles of the University Education Model, and relevant policies?	Yes ✓	No □
Comment: The programme review documentation clearly demonstrates how the programmes align to the university's Strategic Plan and the University Education Model and Graduate Attributes.		
The programmes are underpinned by the ten principles of TU Dublin's <i>Strategic Intent 2030</i> , as evidenced in the diversity of provision and focus on practice and career development (e.g. the introduction of work placement, a work-based learning project, or Erasmus in Semester 2 Year 3 of TU860 & TU863); the student centred approach in providing the opportunity for teamwork, employment of authentic assessments, elective modules (including the restructuring of elective choices to provide flexible specialisations in Year 4 of TU860 & TU863), flexible pathways and agile teaching and learning including multi-modal delivery; the commitment to being inclusive, global and multicultural as evidenced in its strong international cohort and participation in Women in Technology Network.		
The wider description of sustainability under the UN's 17 sustainable development goals (SDGs) was a key factor in the revision and addition of modules as part of this programmatic review which integrated sustainability at the programme level through programme learning outcomes and individual module learning outcomes.		
Do the Programme Management and Quality Assurance arrangements align to TU Dublin Quality Framework processes?	Yes ✓	No □
Comment:	•	•

The Programmes are being managed under the new TU Dublin quality assurance arrangements as			
part of the pilot implementation of Discipline Programme Boards in the Faculty of Computing,			
Digital and Data.			
Has the Annual Monitoring/Academic Quality Enhancement process Yes ✓ No □			
been used to identify issues and actions that continually enhance the			
programme and student learning experience?			
Comment:			
The new Annual Monitoring process was first completed in November 2023 as part of the pilot			
implementation of the new Discipline Programmes Board.			
Chindrent Data			
Student Data			
On consideration of student recruitment data, is there evidence that Yes ✓ No □			
there continues to be a market demand for the programme and that			
the programme remains viable?			
Comment:			
TU860 and TU863 have seen a significant increase in numbers, demonstrating the high demand for the programmes. Numbers have declined on TU757 (L7), due in part to the marked increase in CAO			
entry points, which were raised in an effort to improve retention rates and make it a more			
competitive programme and an overall drop in CAO applications at level 7. TU758 has seen a slight			
increase overall. TU765 and TU885 have seen a decline in numbers over the last few years. The			
strategic choice by the School of Informatics and Cybersecurity to restrict the intake of Level 7			
students in recent years is evident in the reduced enrolment figures for L7 programmes. This policy			
decision in addition to the growth in L8 has also led to a decrease in enrolments for the add-on L7			
and L8 programs, TU765 and TU885, respectively.			
On consideration of student engagement, performance and progression Yes ✓ No □			
data, are students engaging with their programme and performing as			
expected? If not, has this been acknowledged and addressed through			
the programme review process?			
Comment:			
TU860 Approximately 68% of students progress from Year 1 to Year 2, with external students			
replacing those who did not progress. There is a decline in students progressing from Year 2 to Year			
3 and from Year 3 to Year 4. Approximately, 25% of students in Years 2 and 3 are repeating, dropping			
closer to 10% in Years 1 and 4.			
TU863 Typically, about 85% of students progress into Year 2, but this drops to 40% in Year 3 and			
24% in Year 4. The drop in Year 4 reflects the shortages in labour market as many students get jobs			
offers after completing Year 3.			
TU655 Progression rates are high. Of the students that registered in Year 1 between 2018 and 2021,			
86% progressed to year 2 of the programme.			
The School has used this review as an opportunity to address the low progression rates in the later			
years of the programmes, as well as the number of repeats, by introducing 10 credit modules in			
each semester in an endeavour to balance the student workload. The introduction of work			
placement (or work project or Erasmus) is also an attractive draw. In addition, elective choices in			
Year 4 have been restructured to provide flexible specialisations.			
On consideration of graduate destination data, is there evidence that Yes ✓ No □			
students are securing employment in the field or progressing to further			
study in the discipline?			
Comment:			

Awards Standards		
Are the programme aims and learning outcomes clearly written using	Yes □	No ✓
appropriate terminology?		
Comment:		
The panel has made it a condition that the Programme Learning Outco	mes are to be	revised and
rewritten for clarity, conciseness and consistency.		
Are the programme aims and learning outcomes aligned to the	Yes □	No ✓
proposed level of the award on the NFQ in accordance with applicable		
Award Standards?		
Comment:		
The panel has made it a condition that the Programme Learning Outcom	nes should ma	p to the
appropriate level on the National Framework of Qualifications,		
Will the curricula, teaching, learning and assessment methods enable	Yes ✓	No □
students to reach the appropriate standard to qualify for the award(s)?		
Comment:		
Is ongoing programme development appropriately informed by internal	Yes ✓	No □
and external stakeholder input (including industry/practice,		
professional/regulatory bodies, and community organisations)?		

Comment:

The review of these programmes was greatly influenced by changes in both industry and technology and was guided and informed by industry and student feedback (including surveys and focus groups). Module offerings were updated in order to align with industry demands and technological advancements.

TU860 Visits from institutions, such as Rathmines Further Education College, and events such as the Informatics Summer Camp, which has a special focus on coding for girls, and the Coding the Future Event for Computer Science Week, highlight the department's dedication to promoting diversity and inclusion in STEM fields while inspiring the next generation of technologists. The department's involvement in volunteering at local school STEM clubs underscores its commitment to fostering STEM education at grassroots levels and nurturing community relationships.

TU863 The Cybersecurity Programme Team is deeply engaged with both the industry and the secondary school community in Ireland. They organise regular field trips to industry sites, host guest speakers from the industry, and conduct industry-specific sessions. Additionally, in 2023 they collaborated with APWG.eu to organise and host an eCrime conference, fostering a rich exchange of knowledge and best practices in cybersecurity. A key highlight of the discipline is their involvement in the European Cybersecurity Challenge; a member of the team coaches and selects the Irish Team that competes in this prestigious event every year. This same member also contributed to national cybersecurity strategy as a member of a Government Think Tank on Cybersecurity policy and capacity building. They host a large-scale Capture the Flag competition annually in collaboration with Microsoft and ZeroDays, offering the possibility to apply for TU Dublin digital badge to participants. They are academic partners for the ZeroDays CTF, which has attracted over 500 participants from the industry, universities, BSc (Hons) in Science in Digital Forensics and Cybersecurity: Programme Self-Evaluation Report 34 and schools annually. Furthermore, they have developed a Cybersecurity education pathway through the Microsoft Dream Space Digital Academy. The School's research partnerships extend to both industry and NGOs, including collaborations with CommSec, Microsoft, ISPCC, and Hotline.ie.

TU7(TBC)/TU655/TU766 There is a strong emphasis on industry and professional engagement on			
these programmes as evidenced by the 7 months of work placement in both years 1 and 2, totalling			
14 months' work placement prior to graduation. A couple of modules were replaced due to demand			
by industry.			
Does ongoing programme development take account of relevant	Yes ✓	No □	
external discipline benchmarks and Professional Statutory and			
Regulatory Body requirements?			
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's module offerings were updated in order to align to the eve	r-changing ad	vancements
in technology and needs of industry and students.		
The School polled the electives, so they are tailored to the students' into		
that the programme content aligns well with industry and employment		
panel felt that the soft skills need to be made more explicit and mindful		
requirements (e.g. conflict resolution, teamwork, etc.). The panel discus		
Gen AI and Sustainability have been incorporated into the curriculum ar		
School make these elements more explicit in the programme and modu		
the School proposed a title change from TU863 from Digital Forensics and	•	•
Applied Cybersecurity and Digital Forensics to better reflect the increase		•
the practical hands-on nature of the teaching approach employed. Field	•	•
guest speakers from industry and conduct industry-specific sessions. A c	couple of mod	ules on
TU7(TBC)/TU655/TU766 were replaced due to demand by industry.		
Is there a mechanism to ensure the input of external stakeholders in the	Yes ✓	No □
ongoing development of the programme?		
Comment:		
The School demonstrated that it has forged strong ties with industry and is continually engaged		
with and deeply committed to fostering engagement with industry stakeholders.		
Is the programme curriculum well-structured with a logical progression	Yes ✓	No □
of learning and development across the modules and stages?		
The panel recommends that more consideration should be given to put	-	
the co-ordination and rollout of work placements and assigning a placement organiser.		

Comment:

Are there appropriate opportunities for students to undertake work-	Yes ✓	No □
based learning, through work placements or work-based projects or		
assignments?		
Comment:		
The School has introduced a work placement module in year 3 (TU86)	0 & TU863). A	work-based
project or Erasmus is also an option for those students who do not succe	ssfully secure	a placement.
The panel raised the need to ensure that students have clarity on the stru	-	-
to them in this regard. For TU655, students can undertake 7 months of	•	
years 1 and 2, totalling 14 months' work placement prior to graduation.	•	
School have made special provision for students who are unsuccessful ir	•	
Are work/practice placements appropriate and fit for purpose, having	Yes ✓	No 🗆
regard to the requirements of professional, regulatory, and associative	163	NO L
bodies where applicable, in the context of student achievement of		
learning outcomes and in the overall student experience?		
Comment:		
	loorning out	amas with a
The panel recommends that the School undertake a review of module	_	
goal to making them more explicit in terms of the competencies and skill	is acquired, rei	erencing the
NFQ at the appropriate level.		
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:		
Lauring Taraking Q Assessment		
Learning, Teaching & Assessment		
Is there an effective student-centred learning and teaching strategy	Yes ✓	No □
that aligns with the University's strategies and guidelines in this regard?		
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:		
Is there a comprehensive mapping of assessment methods and module	Yes 🗆	No □
learning outcomes and between module learning outcomes and		
programme learning outcomes?		

The panel felt that more clarity is needed in terms of mapping learning outcomes to assessments		
to ensure that they are clearly communicated to students and staff and in order for students to		
have an understanding of what skills and knowledge they will gain.	Yes ✓	
Are there opportunities in all modules to provide students with timely and constructive feedback on their learning and development?	res v	No □
Comment:		
Timely feedback is provided on all assessments in order that students c	an identify are	as that have
been completed satisfactorily and clearly know which sections require f	•	
expect the return of marked assignments with feedback within two we	•	
responsible for the type and approach taken to feedback. The vast		
feedback is provided through the VLE. Here, lecturers can comment, g		•
feedback which can be made available to the students to view online. G		
given during scheduled classes.	ierreransea ree	aback is also
Do the teaching and assessment methods consider the diversity of the	Yes ✓	No □
student cohort?		110
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:		
Are there sufficient staff that are appropriately qualified and capable to	Yes ✓	No □
support the programme delivery?		
Comment:		
The panel were impressed with the staff credentials which demons		_
specialist knowledge, industry experience and a strong engageme		
Programme content and design has been informed and driven by the		
programme team members across a variety of computing topics	•	•
programming languages, web development, data science, human langu	-	gies, artificiai
intelligence, learning analytics, computer vision and high performance of		
Are there appropriate arrangements in place to support the student experience and to monitor student performance?	Yes ✓	No □
Comment:		
Comment.		
Are the access, transfer and progression arrangements including RPL	Yes ✓	No □
clearly defined and appropriate, and aligned to TU Dublin	. 66	NO 🗆
policy/strategy in this regard?		
Comment:		
Do the student supports and learning environment cater for equality,	Yes ✓	No □
diversity and inclusivity of students?		
Comment:		
The School has demonstrated a strong commitment to diversity and	•	
strong international student enrolment, being actively involved in initiatives such as Women In		
Technology United (WITU) which aims to retain women, trans, and gender non-conforming		
students in technology courses and so increases gender diversity in technology courses. This		

includes multiple WITU events through-out the year for TU Dublin students, camps for students in		
local primary and secondary schools, and support for scholarship applications.		
Is the relevant programme information clearly communicated to the	Yes ✓	No □
students to ensure they are informed, guided and cared for?		
Comment:		
The panel felt that more clarity was needed regarding the structure of the programme and work		
placement processes and other options in Year 3. The panel recommends that information on the		
exit awards be provided in the Student Handbook and in the Programme & Module Catalogue		
(Akari).		

Collaborative Provision (if applicable)		
Are the roles and responsibilities of each partner clearly defined?	Yes □	No □
Comment:		
N/A		
In the case of Joint or Multiple Awards, has due diligence on the capacity	Yes \square	No □
of the partner institution to meet the QA/QE requirements for the		
programme been undertaken?		
Comment:		
N/A		

Section F **Overall Recommendation of the Panel** 1. Recommend continuing approval of programme as submitted, without \Box amendment 2. Recommend continuing approval of programme, subject to minor П amendments/editorial changes to be completed as soon as possible and with recommendations for consideration. **Note:** 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 continuing approval of programme subject to the fulfilment of \boxtimes conditions. Recommendations for consideration may also be attached. **Note:** 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 unless a response to the Review Report is submitted with revised programme documentation. 4. Do not recommend continuing approval of programme.

Areas	for commendation
	The panel commends the School for the amount of work that they put into the programme review process and comprehensive supporting documentation that was provided to the panel. The dedication, commitment and enthusiasm of the Programme Team was evident to the Panel.
	The School demonstrated a strong engagement with industry. Staff are research active and demonstrated a breath of research collaborations and publications.
	The School demonstrated a clear understanding of student needs in an industrial environment and enhanced the programmes accordingly in order to better equip students for the end market.
	The panel noted the impressive feedback from students, who spoke very highly of their experience in the School, during its meeting with them.
	The panel commends the School's endeavours in supporting diversity and inclusion and its initiatives to increase participation of women and girls in technology.

Condit	ions of Approval		
Condit	• •		
1.	Programme Handbooks require information to accurately reflect the structure of the programmes, e.g. there needs to be more clarity with regard to the work placement process, elective options available to the students and information on exit award options need to be clearly defined in both the handbooks and in the Programme & Module Catalogue (Akari). Cybersecurity Response: Relevant sections were added to the Handbook. Awards are listed		
	in Akari for TU863 and TU758.		
2.	Programme Learning Outcomes need to be revised and rewritten for clarity, conciseness and consistency.		
	Cybersecurity Response: Programme Learning Outcomes were revised and updated for conciseness, clarity, and consistency. The total number for each programme was reduced from 17 to 9.		
3.	Programme Learning Outcomes should map to the appropriate level on the National Framework of Qualifications.		
	Cybersecurity Response:		
	NFQ Level 7 Descriptors:		
	Specialised knowledge across a variety of areas (KB)		
	Recognition of limitations of current knowledge and familiarity with sources of new knowledge; integration of concepts across a variety of areas (KK)		
	 Demonstrate specialised technical, creative or conceptual skills and tools across an area of study (KH&SR) 		
	 Exercise appropriate judgement in planning, design, technical and/ or supervisory functions related to products, services, operations or processes. (KH&SS) Utilise diagnostic and creative skills in a range of functions in a wide variety of contexts (CC) 		
	 Accept accountability for determining and achieving personal and/ or group outcomes; take significant or supervisory responsibility for the work of others in defined areas of work (CR) 		

- Take initiative to identify and address learning needs and interact effectively in a learning group (CLL)
- Express an internalised, personal world view, manifesting solidarity with others
 (CI)

Mapping of Revised PLOs to NFQ Level 7:

1. Develop a solid understanding of computing fundamentals, including software development, networking, data structures, algorithms, and system architecture, to support basic to intermediate cybersecurity strategies.

This PLO aligns with the Knowledge Base descriptor as it involves acquiring specialised knowledge in fundamental areas essential for cybersecurity strategies.

2. Evaluate and apply established cybersecurity frameworks, methodologies, and technologies to develop solutions that address user needs while maintaining privacy and integrity.

This PLO is related to the Knowledge Kind and Know-How & Skill - Selectivity descriptors as it requires integrating and applying knowledge of cybersecurity frameworks and technologies to create effective solutions.

3. Understand and describe the key aspects of the cybersecurity domain, including network security, digital forensics, and ethical considerations, to inform appropriate responses.

This PLO maps to the Knowledge Kind and Competence - Context descriptors, focusing on understanding and describing critical cybersecurity concepts and their application in different contexts, including ethical considerations.

4. Identify vulnerabilities in systems using standard analytical techniques and recommend improvements to enhance security.

This PLO aligns with the Knowledge Kind descriptor as it involves using analytical knowledge to identify and address vulnerabilities within systems.

 Demonstrate skills in securing network infrastructures, mitigating threats, and participating in project management with a focus on collaboration and ethical practices.

This PLO relates to the Know-How & Skill - Selectivity and Competence - Context descriptors, requiring the application of technical skills, collaboration, and ethical practices in network security and project management.

6. Apply problem-solving strategies and basic research skills to evaluate cybersecurity solutions, understand industry trends, and support decision-making processes.

This PLO maps to the Knowledge Kind, Know-How & Skill - Range, and Competence - Insight descriptors, focusing on applying problem-solving, research skills, and insights into decision-making processes in cybersecurity.

7. Engage in professional development to enhance technical skills and personal competence, contributing effectively to team efforts in cybersecurity projects.

This PLO aligns with the Competence - Learning to Learn and "Competence - Context" descriptors, emphasising ongoing professional development and effective team contributions.

8. Communicate cybersecurity concepts and solutions effectively to technical and non-technical audiences.

This PLO relates to the Know-How & Skill - Selectivity and Competence - Context descriptors, focusing on clear communication of cybersecurity concepts across different audience types.

9. Implement basic sustainable practices within cybersecurity projects, considering environmental impacts.

This PLO maps to the Knowledge Kind and Competence - Context descriptors, focusing on applying knowledge and considering sustainability and environmental impacts in cybersecurity projects.

NFQ Level 8 Descriptors:

- An understanding of the theory, concepts and methods pertaining to a field (or fields) of learning (KB)
- Detailed knowledge and understanding in one or more specialised areas, some of it at the current boundaries of the field(s) (KK)
- Demonstrate mastery of a complex and specialised area of skills and tools; use and modify advanced skills and tools to conduct closely guided research, professional or advanced technical activity (KH&SR)
- Exercise appropriate judgement in a number of complex planning, design, technical and/or management functions related to products, services, operations or processes, including resourcing (KH&SS)
- Use advanced skills to conduct research, or advanced technical or professional activity, accepting accountability for all related decision making; transfer and apply diagnostic and creative skills in a range of contexts (CC)
- Act effectively under guidance in a peer relationship with qualified practitioners;
 lead multiple, complex and heterogeneous groups (CR)
- Learn to act in variable and unfamiliar learning contexts; learn to manage learning tasks independently, professionally and ethically(CLL)
- Express a comprehensive, internalised, personal world view manifesting solidarity with others (CI)

Mapping of Revised PLOs to NFQ Level 8:

1. Synthesise knowledge of computing fundamentals to support advanced cybersecurity strategies, addressing software development, networking, data structures, algorithms, data science, AI, and system architecture.

This PLO maps to Knowledge Base as it involves synthesising theoretical and conceptual knowledge across multiple areas of computing to support advanced cybersecurity strategies.

2. Evaluate, develop, and adapt cybersecurity frameworks, methodologies, and technologies to meet specific organizational and user needs, ensuring privacy, integrity, and compliance.

This PLO maps to Knowledge Kind (KK) and Know-How & Skill - Selectivity (KH&SS) as it requires detailed knowledge and understanding in cybersecurity, particularly at the current boundaries of the field, and applying judgment in complex, practical situations.

3. Analyse and address the complexities of cybersecurity, including network security, cryptography, cyber law, digital forensics, and ethical considerations, to create nuanced and responsible solutions.

This PLO maps to Knowledge Kind (KK) and Competence - Context (CC) as it involves applying advanced skills to analyse and address complex cybersecurity issues responsibly, with a deep understanding of specialised areas in the field.

4. Diagnose vulnerabilities in complex systems and recommend improvements using advanced analytical techniques and innovative defence mechanisms.

This PLO maps to Know-How & Skill - Range (KH&SR) as it requires mastery of complex analytical techniques and tools to diagnose and address vulnerabilities, demonstrating advanced technical skills.

5. Lead and manage cybersecurity projects using agile methodologies, with a focus on team collaboration, effective communication, and ethical practices.

This PLO maps to Competence - Role (CR) and Know-How & Skill - Selectivity (KH&SS) as it involves leading and managing projects, exercising appropriate judgment, and working effectively with peers and teams in complex scenarios.

Engage in continuous professional development to enhance both technical
mastery and personal competence in cybersecurity, staying current with trends
and emerging threats.

This PLO maps to Competence - Learning to Learn (CLL) and Know-How & Skill - Range (KH&SR) as it emphasises ongoing professional development, managing learning tasks independently, and adapting to new challenges in cybersecurity.

7. Develop critical research skills to evaluate cybersecurity trends and technologies and cultivate leadership in planning and executing complex projects.

This PLO maps to Competence - Context (CC) and Competence - Insight (CI) as it focuses on developing advanced research skills, taking accountability for decision-making, and leading complex projects.

8. Effectively communicate complex cybersecurity concepts and solutions to both technical and non-technical audiences.

This PLO maps to Competence - Role (CR) and Competence - Context (CC) as it involves effectively communicating complex concepts, an essential skill in leadership and collaboration.

9. Implement sustainable practices within cybersecurity projects, emphasizing environmental impacts and green technologies.

This PLO maps Competence - Context (CC) and Knowledge - Kind (KK) as it involves applying a broad, ethical worldview and exercising judgment in implementing sustainable practices in cybersecurity, reflecting a comprehensive internalised perspective.

4. Award classifications need to be provided in the handbooks and in the Programme & Module Catalogue (Akari).

Cybersecurity Response: The following were added to the Handbook and Akari:

L6/7 Award Classification

Classification	GPA Required	Indicative Description
Pass	2.00	Attains all the minimum
		intended programme
		learning outcomes
Merit Grade 2	2.50	Pass and achievement is
		significantly beyond pass
		standard in some respects
Mert Grade 1	3.00	Pass and achievement is
		significantly beyond pass
		standard in many respects
Distinction	3.25	Pass and achievement is
		significantly and
		consistently beyond pass
		standard in most respects

L8 Award Classification

Classification	GPA Required	Indicative Description
Pass	2.00	Attains all the minimum
		intended programme
		learning outcomes
Second Class Honours	2.50	Pass and achievement is
Grade 2		significantly beyond pass
		standard in some respects
Second Class Honours,	3.00	Pass and achievement is
Grade 1		significantly beyond pass
		standard in many respects
First Class Honours	3.25	Pass and achievement is
		significantly and
		consistently beyond pass
		standard in most respects

The indicative syllabus needs to be entered in each of the module descriptors in the Programme & Module Catalogue (Akarl).

Cybersecurity Response:

We reviewed all modules on the programmes, the indicative syllabus is included on Akari for all.

Recommendations

1. Undertake a review of module learning outcomes with a goal to making them more explicit in terms of the competencies and skills acquired, referencing the NFQ at the appropriate level.

Cybersecurity Response:

We plan to review the module learning outcomes during the 2024/2025 academic year, aiming to clarify the competencies and skills acquired, and align them with the National Framework of Qualifications at the appropriate level.

2. More clarity is required in terms of mapping learning outcomes to assessments to ensure that they are clearly communicated to students so that they have an understanding of what skills and knowledge they will gain.

Cybersecurity Response:

All modules utilise Akari's native functionality to align assessments with learning outcomes. This alignment is clearly communicated to students during the introductory lecture of each module, ensuring they understand the skills and knowledge they are expected to gain.

Incorporate soft and professional skills relevant to the graduate industry sectors throughout the years of the programmes (such as teamwork, conflict resolution, problem-solving, leadership and innovation, managing your manager, etc., and implementation of a performance improvement plan (PIP).

Cybersecurity Response:

Soft skills relevant to the cybersecurity industry are covered in our 1st year Personal and Professional Development module and we have introduced a new module focused on developing Project/Placement Skills. We have incorporated soft skills into the assessment of every 10-credit module. Problem-solving is integrated across various modules. To further enhance our programme, we plan to include more detailed content on feedback reception in the indicative syllabi. Additionally, management and leadership skills are already emphasised through group work in many modules.

4. Consideration should be given to putting more structure around the securing, co-ordination and rollout of work placements and assigning a placement coordinator. A Placement Handbook should be developed for all programmes outlining the roles and responsibilities of the placement site, the student and the School.

Cybersecurity Response:

We are planning to enhance the structure of work placements by appointing a placement coordinator and developing a Placement Handbook. This handbook will outline the roles and responsibilities of the placement site, the student, and the School. This initiative is included in the School's plan for the academic year 2024/2025.

The school will be guided by the experience of programs like TU655 that already include work placement modules and have comprehensive work placement information contained in both student and supervisor work placement handbooks.

5. Consider introducing learning outcomes which focus on the use of software development pipelines and code repositories in order to create a long-term student portfolio.

Cybersecurity Response:

The Project and Placement Skills module already includes comprehensive learning outcomes focused on software development pipelines and code repositories. These outcomes cover:

1. Software Life Cycle:

- Planning and requirements analysis.
- o Implementation, testing, and documentation.
- o Agile, Scrum, and Pair Programming methodologies.

2. Software Project Management:

- Planning and leading software projects.
- o Project scheduling and estimation.
- Effective application of contemporary project management methodologies.

3. Version Control:

- Management and organization of software archives for multi-developer projects.
- Distributed revision control and comparison of revision control software tools.

4. Collaboration Tools:

- o Computer-supported cooperative work (CSCW).
- Use of electronic communication, project management tools, and electronic conferencing tools.
- o Collaborative management (coordination) tools.

These elements collectively aim to foster a long-term student portfolio by integrating essential software development skills and tools.

6. More explicit detail should be provided in the module descriptors with regard to how sustainability and Gen Al are considered or embedded in the modules.

Cybersecurity Response:

Sustainability is explicitly included in the learning outcomes of all relevant modules. Given the rapid evolution of General AI technology, we have chosen not to use specific terminology but instead refer to 'advanced data science and AI techniques' to maintain flexibility and relevance as the field progresses. This approach allows us to adapt to changes and emerging trends in AI technology while ensuring that the curriculum remains current and applicable.

7. Clarification should be provided to students on the use of Gen AI per module and should be provided in the assessment brief. In addition, consideration should be given to and how GEN AI should form part of a student's toolkit.

Cybersecurity Response:

Clarification on the use of Generative AI in each module is typically provided to students in individual modules, though it is not currently documented in the SER or Akari. The university has a policy, which we implement. Given that different modules may utilise General AI in various ways, module leaders require the flexibility to define and integrate these technologies based on specific educational goals. Moving forward, we will ensure that the assessment briefs include explicit details on how Generative AI is employed within

the module and its significance in the student's toolkit, enhancing both transparency and
applicability.
More detail needs to be provided on how the final project is assessed.
Cybersecurity Response:
Students on TU863, and TU758 are provided with a comprehensive specific project
handbook that covers all aspects of the capstone project.
The full module descriptors should be entered in the Student Handbook.
Cybersecurity Response:
The full module descriptors are accessible on Akari, and to avoid overwhelming the
Student Handbook with extensive details for all four years of the programme, they will not
be included directly in the Handbook. Instead, a link to the relevant Akari page will be
provided in the Handbook, ensuring that all necessary information is easily accessible to
students without overloading the document.

Other matters to be brought to the attention of Faculty Board and/or Academic Quality	
Assurance & Enhancement Committee	

Section G	Approvals

Review Report		
This Review Report has been agreed by the Review Panel and is signed on its behalf by the Panel		
Chair.		
Signed:	Date: 26/06/2024	

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, Informatics and Cybersecurity	
Geraldine Gray	Date: 26/08/2024

Faculty Board	
The report and response have been approved by Faculty Board	d
Head of Learning Development:	

	Cara San	Date: 13/09/2024
Signed:		

Academic Quality Assurance & Enhancement Committee			
The report and response have been approved by the Academic Quality Assurance & Enhancement			
Committee			
Head of Academic Affairs:			
Signed:	Date: Click or tap to enter a date.		