

Programme Review Report

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

&

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

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- campus ✓	Blend	ed □
	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 Scienc	e (Honour	rs) 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 respect
Award (1) Title	Bachelor of Scienc	e in Comp	outing (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	Bachelor of Scientification	=	rs) in Computing (Information Technology)
Exit/Embedded	Exit 🖂	nonours yea	embedded 🖂
NNFQ Level	8		Cilibeadea 🖂
Award Class	Major		
ECTS Credits	60		
Classification of award	Classification	GPA	Indicative Description
Classification of award	Classification	Required	
	Pass	2.00	Attains all the minimum intended programme
			learning outcomes
	Second Class Honours Grade	2.50	Pass and achievement is significantly beyond pass standard in some respects
	Second Class	3.00	Pass and achievement is significantly beyond
	Honours, Grade		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		te in Science	e in Computing in Information Technology
/wara (5) Title	(TU653)	ite iii seleliee	a in computing in information recimology
	· ·	red in CAO, l	out retained as exit award for TU757 and
	TU860)	ŕ	
Exit/Embedded	Exit 🖂		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 Programme Details						
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-car	npus √	Blended ✓			
	Online 🗆		Hyflex □			
Classification of	Classification	GPA	Indicative Description			
award		Required				
	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			
	Tionours		respects			
Discipline	Informatics & Cybersecurity					
Programmes						
Board						
Faculty Board	Faculty of Compu					
Schools involved	Informatics & Cyb	ersecurit	У			
in delivery Delivery location	Blanchardstown (Samnus				
Collaborative	Blanchardstown Campus NA					
Partner (where						
applicable)						
Date of	September 2024					
Commencement						
of revised						
programme						
Section B	Awards		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
Award Title	Bachelor of Science	ce (Honou	ırs) in Applied Cybersecurity and Digital Fo	rensics		

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		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		
A	Darlada at Oais		Ed O to a de la Contraction de		
Award (1) Title			lied Cybersecurity and Digital Forensics		
Exit/Embedded		<u> </u>	embedded ⊠		
NNFQ Level	7				
Award Class	Major				
ECTS Credits	180				
Classification of			T- "	٦	
award		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 Scien	nce in Con	nputing in Digital Forensics & Cyber Security		
Exit/Embedded	Exit	₫	embedded 🗆		
NNFQ Level	7				
Award Class	Major				
ECTS Credits	60				
Classification of		GPA Required	Indicative Description		
award		2.00	Attains all the minimum intended programme learning outcomes	1	
	Merit Grade 2	2.50	Pass and achievement is significantly beyond pass standard in some respects	1	
	Mert Grade 1	3.00	Pass and achievement is significantly beyond pass standard in many respects	1	
	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 \Box		
NNFQ Level	6	6			
Award Class	Major	Major			
ECTS Credits	120	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 (L6) & 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- Blended			
delivery	campus \square			
	Online 🗆	Hyf	lex □	
Classification of	Classification	GPA	Indicative Description	
award	Pass	Required 2.00	Attains all the minimum intended programme	
	1 433	2.00	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 & C	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	outing 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			in Computing in Secure Networking Technologies
Exit/Embedded	Exit 🗵		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]	embedded 🖂
NNFQ Level	7		
Award Class	Major		
ECTS Credits	60		
Classification of			
award			
Section C - Progra	amme Derogati	ons (if requ	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		
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	Yes ✓	No □
Programme Review Process, i.e. were current students, graduates,		
employers, other appropriate stakeholders involved in the review		
process?		
Comment: The School had proactively engaged with a range of stake	•	
industry and students, and it was evident that their feedback actively 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	Yes ✓	No □
principles of the University Education Model, and relevant policies?		
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		
Strategic Intent 2030, 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.	Voc. /	
Do the Programme Management and Quality Assurance arrangements	Yes ✓	No □
align to TU Dublin Quality Framework processes?		
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 Novembe	r 2023 as part	of the pilot	
implementation of the new Discipline Programmes Board.			
Children Data			
Student Data On consideration of student rescriptment data is these evidence that	Yes ✓	No. 🗆	
On consideration of student recruitment data, is there evidence that there continues to be a market demand for the programme and that	165 4	No □	
the programme remains viable?			
Comment:			
TU860 and TU863 have seen a significant increase in numbers, demonst	rating the high	demand for	
the programmes. Numbers have declined on TU757 (L7), due in part to t			
entry points, which were raised in an effort to improve retention r			
competitive programme and an overall drop in CAO applications at leve			
increase overall. TU765 and TU885 have seen a decline in numbers ov		_	
strategic choice by the School of Informatics and Cybersecurity to res		•	
students in recent years is evident in the reduced enrolment figures for			
decision in addition to the growth in L8 has also led to a decrease in en			
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:	1	•	
TU860 Approximately 68% of students progress from Year 1 to Year	2, with exter	nal 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 of	-		
24% in Year 4. The drop in Year 4 reflects the shortages in labour market	t as many stud	ents get jobs	
offers after completing Year 3.			
	41	40 10004	
TU655 Progression rates are high. Of the students that registered in Year	1 between 20	18 and 2021,	
86% progressed to year 2 of the programme.			
The School has used this review as an enperturity to address the law pr	aarassian rata	s in the later	
The School has used this review as an opportunity to address the low pr years of the programmes, as well as the number of repeats, by introd	_		
each semester in an endeavour to balance the student workload.	_		
placement (or work project or Erasmus) is also an attractive draw. In a			
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	1.03	110 🗆	
study in the discipline?			
Comment:	1	<u>I</u>	

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	e revised and
rewritten for clarity, conciseness and consistency.		
Are the programme aims and learning outcomes aligned to the	Yes \square	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 Outcon	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	ooth years 1 ar	nd 2, totalling
14 months' work placement prior to graduation. A couple of modules we	re replaced du	ie 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 placer	the co-ordination and rollout of work placements and assigning a placement organiser.		

Comment:

Are there appropriate opportunities for students to undertake work-based learning, through work placements or work-based projects or	Yes ✓	No □
assignments?		
Comment: The School has introduced a work placement module in year 3 (TU86 project or Erasmus is also an option for those students who do not succe. The panel raised the need to ensure that students have clarity on the struto them in this regard. For TU655, students can undertake 7 months of the structure of th	essfully secure acture and opti	a placement. ons available
e · · · · · · · · · · · · · · · · · · ·	•	
years 1 and 2, totalling 14 months' work placement prior to graduation		
School have made special provision for students who are unsuccessful in		k placement.
Are work/practice placements appropriate and fit for purpose, having regard to the requirements of professional, regulatory, and associative bodies where applicable, in the context of student achievement of learning outcomes and in the overall student experience?	Yes ✓	No □
Comment:	I .	
The panel recommends that the School undertake a review of module goal to making them more explicit in terms of the competencies and skil NFQ at the appropriate level.	_	
If applicable, have the relevant Blended Learning Checklists (i.e. Learning Experience Context & Programme Context) been fully completed and submitted to the Panel?	Yes □	No □
Comment:		
Is the required programme and module information provided in the correct format?	Yes ✓	No □
Comment:		
Learning, Teaching & Assessment		
Is there an effective student-centred learning and teaching strategy that aligns with the University's strategies and guidelines in this regard?	Yes ✓	No □
Comment:		
Does the assessment strategy provide an appropriate mix of assessment types that will enable students to demonstrate that they have met the module and programme learning outcomes?	Yes ✓	No □
Comment:		
Do the learning outcomes and assessment strategy ensure that academic integrity can be maintained and attempted breaches of academic integrity are minimised/easily detected?	Yes ✓	No □
Comment:		
Is there a comprehensive mapping of assessment methods and module learning outcomes and between module learning outcomes and programme learning outcomes?	Yes 🗆	No 🗆

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.			
Are there opportunities in all modules to provide students with timely	Yes ✓	No □	
and constructive feedback on their learning and development?			
Comment:			
Timely feedback is provided on all assessments in order that students ca	n identify are	as that have	
been completed satisfactorily and clearly know which sections require fu	•		
expect the return of marked assignments with feedback within two wee	•		
responsible for the type and approach taken to feedback. The vast			
feedback is provided through the VLE. Here, lecturers can comment, gr			
feedback which can be made available to the students to view online. Ge			
given during scheduled classes.	illeraliseu lee	uback is also	
	Yes ✓		
, , ,	res v	No □	
student cohort?			
Comment:			
Student Supports & Learning Environment			
	Yes ✓	No □	
and physical) to support the proposed programme aims and objectives,	. 65	но 🗅	
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 demonst	rated a dive	rse range of	
specialist knowledge, industry experience and a strong engagemen		_	
Programme content and design has been informed and driven by the			
programme team members across a variety of computing topics a			
programming languages, web development, data science, human languages	•	_	
intelligence, learning analytics, computer vision and high performance co	-	,.es, a. ee.a.	
	Yes ✓	No □	
experience and to monitor student performance?	. 63	NO L	
Comment:			
Are the access, transfer and progression arrangements including RPL	Yes ✓	No □	
clearly defined and appropriate, and aligned to TU Dublin	. 63	NO L	
policy/strategy in this regard?			
Comment:			
Comment.			
Do the student supports and learning environment cater for equality,	Yes ✓	No 🗆	
	163 •	No □	
diversity and inclusivity of students? Comment:			
	achieivity ac	avidenced in	
The School has demonstrated a strong commitment to diversity and in	-		
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	_	_	
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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 recommen	ds that inform	nation on the
exit awards be provided in the Student Handbook and in the Program	mme & Modu	le 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	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.		

Conditions of Approval

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).

Informatics Response: Relevant sections have been added to the Student Handbook. Awards are listed in Akari for TU757, TU860, TU883 and TU655.

2. Programme Learning Outcomes need to be revised and rewritten for clarity, conciseness and consistency.

Informatics Response: Programme Learning Outcomes were revised and updated for conciseness, clarity, and consistency.

3. Programme Learning Outcomes should map to the appropriate level on the National Framework of Qualifications.

Informatics Response:

NFQ Level 7 Descriptors

- Knowledge (Breath): Specialised knowledge across a variety of areas.
- *Knowledge (Kind):* Recognition of limitations of current knowledge and familiarity with sources of new knowledge; integration of concepts across a variety of areas.
- *Know-how and skill (Range):* Demonstrate specialised technical, creative or conceptual skills and tools across an area of study.
- *Know-how and skill (Selectivity):* Exercise appropriate judgement in planning, design, technical and/ or supervisory functions related to products, services, operations or processes.
- *Competence (Context):* Utilise diagnostic and creative skills in a range of functions in a wide variety of contexts.
- Competence (Role): 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.
- Competence (Learning to learn): Take initiative to identify and address learning needs and interact effectively in a learning group.

• Competence (Insight): Express an internalised, personal world view, manifesting solidarity with others.

Mapping of revised PLO's to NFQ Level 7

1. *Knowledge Breath* - Demonstrate an in-depth knowledge across a broad spectrum of computer science areas such as software engineering, data structures, algorithms, web development, computer networks, operating systems, data science, cloud computing, information systems and professional and ethical issues that are essential for developing solutions in diverse technological contexts.

This PLO aligns with the knowledge breath descriptor as it involves acquiring specialised knowledge in fundamental areas essential for computing.

2. *Knowledge Kind* - Integrate knowledge from various computing domains to critically evaluate existing solutions and create new solutions that address complex problems. This includes the ability to recognize gaps in their understanding and actively seek out sources of new knowledge to drive continuous improvement in their work.

This PLO aligns with the knowledge kind descriptor as it emphasises the students ability to integrate knowledge acquired across a variety of computing areas to evaluate existing solutions and source new knowledge to create new improved solutions to complex problems.

3. *Know-how and Skill-Range* - Model, design, implement, deploy and critically evaluate solutions that employ tools and technologies in areas such as software engineering, user interface development, information systems, web-based solutions, cloud computing, data science, secure systems, and programming languages. This includes the ability to communicate design decisions clearly and persuasively in both written and oral forms.

This PLO aligns with the know-how and skill-range as requires students to have the practical skills to design, model and deploy software solutions using a variety of tools and technologies while being able to defend their design decisions in written and oral form to a wide variety of audiences.

4. *Know-how & Skill-Selectivity* - Exercise appropriate judgement in the application of best practices in designing, implementing and deploying digital solutions by considering appropriate tools, information sources, appropriate solution evaluation and technology selection criteria. This includes the ability to adhere to ethical standards and explain the economic, social, and environmental impact of digital solutions.

This PLO aligns with the know-how and skill-selectivity descriptor as it emphasises the students ability to exercise appropriate judgement in selecting the appropriate tools and technologies to use for a given solution. This PLO also emphasises the importance of design decisions and technology selection with regard to creating solutions that are sustainable, ethical and social & economically beneficial.

5. Competence Context - Apply diagnostic and creative skills across a wide variety of functions in computer science, including software engineering, web development, information systems, data structures, computer systems, computer networks, and data science. Graduates will be skilled in identifying and resolving complex technical issues using appropriate diagnostic tools to ensure solutions meet their requirements and minimise risk associated with computing systems.

This PLO maps to the Competence Context descriptor as it requires students to use their knowledge and creative skills to diagnose and resolve complex technical issues while ensuring solutions meet their requirements in a safe and ethical manner.

6. *Competence Role* – Accept accountability for determining and achieving both personal and group outcomes in various practical settings, including group projects and work placement. This will include the ability to work under guidance as part of an interdisciplinary team, plan and organise work, and monitor progress against a project plan.

This PLO aligns with the Competence Role descriptor as it requires students to take responsibility for their roles in the context of individual and group work while demonstrating effective communication skills at different levels of an organisation.

7. Competence-Learning to Learn - Take the initiative in identifying and addressing their own learning needs by actively engaging with and contributing to lectures, practical sessions and tutorials. Graduates will be skilled in generating new ideas and applying the knowledge they have gained to novel situations, showcasing adaptability and innovation in various contexts within the field of computer science.

This PLO maps to the Competence Learning to Learn descriptor as it requires students to actively engage with their studies and identify gaps in their learning that need attention. The PLO also requires students to demonstrate the ability to create new ideas, using existing knowledge, that can be applied to solutions in the field of computer science.

8. *Competence Insight* - Articulate and embody a personal worldview that reflects a commitment to social responsibility, solidarity with others, and an understanding of social, economic, diversity, and ethical issues. Graduates will apply this perspective to their work in computer science, making informed decisions that consider the broader impact on society.

This PLO aligns with the Competence Insight descriptor as it demands that graduates consider the wider implications of the decisions they take in designing, implementing, and deploying computing solutions.

NFQ Level 8 Descriptors

- *Knowledge (Breath):* An understanding of the theory, concepts and methods pertaining to a field (or fields) of learning.
- *Knowledge (Kind):* Detailed knowledge and understanding in one or more specialised areas, some of it at the current boundaries of the field(s).
- Know-how and skill (Range): 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.
- *Know-how and skill (Selectivity):* Exercise appropriate judgement in a number of complex planning, design, technical and/or management functions related to products, services, operations or processes, including resourcing.
- Competence (Context): 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.
- *Competence (Role):* Act effectively under guidance in a peer relationship with qualified practitioners; lead multiple, complex and heterogeneous groups.
- Competence (Learning to learn): Learn to act in variable and unfamiliar learning contexts; learn to manage learning tasks independently, professionally and ethically.
- *Competence (Insight):* Express a comprehensive, internalised, personal world view manifesting solidarity with others.

Mapping of revised PLO's to NFQ Level 8

Knowledge Breath - Demonstrate an understanding of theory, concepts and methods across
a spectrum of computer science areas such as software quality, advanced web development,
data science & AI, cloud computing, internet of things, mobile computing, text analytics,
natural language processing, high performance computing, digital & extended reality, green
computing, and professional and ethical issues that are essential for developing solutions in
diverse technological contexts.

This PLO aligns with the knowledge breath descriptor as it involves acquiring specialised knowledge pertaining to a field (or fields) of computing appropriate for NFQ level 8.

2. *Knowledge Kind* - Explain concepts and theories in one or more specialist computing areas, including some state-of-the-art technologies. This includes the ability to describe the

limitations of current computing theories and explain how academic and industrial research can lead to new computing knowledge and technologies.

This PLO aligns with the knowledge kind descriptor for NFQ level 8 as it emphasises the graduates ability to deal with concepts and theories in specialist areas, supported by elective streaming options in year 4, in addition to understanding importance of academic and industrial research that drives progress towards ever more efficient and suitable digital solutions.

3. Know-how and Skill-Range - Demonstrate mastery of a range of specialised development tools, and development methodologies, and apply this knowledge to develop complex solutions that meet specified requirements. This includes the ability to conduct supervised research and critically evaluate information from a variety of sources to inform decision-making and the development of novel solutions.

This PLO aligns with the know-how and skill-range for NFQ level 8 as it requires students to master specialised tools to develop solutions that meet specified requirements. This will require students to conduct research in specialised computing topics to ensure the appropriate design choices have been made and their solutions adhere to best practices in the problem domain.

4. *Know-how & Skill-Selectivity* - Manage a computer-based project through all stages of the project lifecycle by developing project plans, specifications, and solution designs along with implementation and deployment strategies. This will include the ability to leverage best practices and consider appropriate evaluation criteria, ethical standards, economic and social benefits, and environmental impact.

This PLO aligns with the know-how and skill-selectivity descriptor for NFQ level 8 as it requires students to demonstrate planning, design, technology selection, and project management skills across the life cycle of a computing project. Key to this is the justification of design decisions, choice of development methodology, choice of technologies and evaluation criteria to ensure the correct balance between quality and trade-offs presented within a given problem.

5. Competence Context - Research, select and implement measures to identify risks and ensure safety in the use of computer technology in real-world contexts. Graduates will adopt appropriate professional and ethical practices, applying creative and diagnostic skills across various contexts. Additionally, graduates will critically assess the impact of new technologies in specific environments, making informed decisions that balance innovation with ethical considerations and risk management.

This PLO maps to the Competence Context descriptor for NFQ level 8 as it requires students to accept accountability for the safety, legal, sustainability and ethical implications associated with design and implementation decisions. Key to this is the ability to research and select best practices in a range of real-world computing contexts.

6. Competence Role – Complete capstone projects and manage the complexities of working within diverse and dynamic groups, recognizing and effectively navigating different roles within a team adapting to various cultural dynamics. Graduates will also demonstrate the ability to constructively criticise and provide feedback to others, and to reflect on their own performance, learning from their experiences and adapting their approach to improve their own and others' performance.

This PLO aligns with the Competence Role descriptor for NFQ level 8 as it requires students to demonstrate the ability to work as part of a diverse team by understanding various team roles within an organisation. In addition, it requires students to develop the skills necessary to provide constructive feedback to their peers that can also lead to self-improvement.

7. Competence-Learning to Learn - Develop complex solutions to real-world problems and demonstrate the ability to direct their own learning in unfamiliar contexts taking responsibility for independent learning to address knowledge gaps. This will include the ability to select appropriate research strategies, evaluate their own strengths and weaknesses, and criticise their own work.

This PLO maps to the Competence Learning to Learn descriptor for NFQ level 8 as it requires students to actively engage with their studies and identify gaps in their learning that need attention. The PLO also requires students to demonstrate the ability to work in unfamiliar contexts, identify their strengths and weaknesses and criticise their own work which is evidence of the learn-to-learn ability.

8. Competence Insight - Articulate and embody a personal worldview that reflects a commitment to social responsibility, solidarity with others, and an understanding of social, economic, environmental, diversity, and ethical issues. Graduates will apply this perspective to their work in computer science, making informed decisions that consider the broader impact on society, and will advocate for inclusivity and ethical practices in technology development and deployment.

This PLO aligns with the Competence Insight descriptor at NFQ level 8 as it demands that graduates consider the wider implications of the decisions they take in designing, implementing, and deploying sustainable computing solutions. In addition, it also calls on graduates to become advocates for inclusivity and ethics in the development and deployment of computing solutions.

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

Informatics Response: The award classifications listed below have been added to Akari and student handbooks.

L7 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 Grade	2.50	Pass and achievement is
2		significantly beyond pass
		standard in some respects
Second Class Honours, Grade	3.00	Pass and achievement is
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).

Informatics Response: An indicative syllabus is included for all modules on TU757, TU860, TU883, TU655 and TU766.

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.

Informatics 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.

Informatics 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).

Informatics Response: Soft skills relevant to the computer 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. Problem-solving is integrated across various modules. To further enhance our programme, we plan to include more detailed content on conflict resolution and 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.

Informatics 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.

Informatics Response:

The Advanced Programming and 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:
 - o 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 multideveloper projects.
 - Distributed revision control and comparison of revision control software tools.
- 4. Collaboration Tools:
 - Computer-supported cooperative work (CSCW).
 - Use of electronic communication, project management tools, and electronic conferencing tools.
 - o Collaborative management (coordination) tools.

In additional to the above, version control systems such as GitHub are widely used across modules to distribute template code and students are encouraged to make regular commits to code repositories to show continual progress on assessments and project work.

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 AI are considered or embedded in the modules.

Informatics Response: Sustainability is explicitly included in the learning outcomes of all relevant modules. Given the rapid evolution of Generative AI technology, we have chosen not to use specific terminology but instead refer to 'advanced' data science and AI

7.	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. 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.
	Informatics 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 Generative 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.
8.	More detail needs to be provided on how the final project is assessed. Informatics Response: Students on TU860, and TU883 are provided with a comprehensive specific project handbook that covers all aspects of the final year project.
9.	The full module descriptors should be entered in the Student Handbook. Informatics 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		

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

Approvals

School Response

Section G

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		
Head of Learning Development:		
Signed:	Date: 13/09/2024	

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.	