QQI
Quality and Qualifications Ireland
Dearbhú Cáilíochta agus Cáilíochtaí Éireann

Independent Evaluation Report on an Application for Validation of a Programme of Education and Training

Part 1.   Provider details

Provider name	Dublin Business School
Date of site visit	31 Jul 2020
Date of report	

Section A.   Overall recommendations

Principal programme	Title	Master of Science in Cybersecurity
	Award	Master of Science
	Credit	90
	Recommendation *Satisfactory OR Satisfactory subject to proposed conditions OR Not Satisfactory*	Satisfactory subject to proposed conditions

Embedded programme 1	Title	Postgraduate Diploma in Science in Cybersecurity
	Award	Postgraduate Diploma in Science
	Credit	60
	Recommendation *Satisfactory OR Satisfactory subject to proposed conditions OR Not Satisfactory*	Satisfactory subject to proposed conditions

Section B.   Expert Panel

Name	Role	Affiliation
Mr. Daniel Brennan	Chair	Former Registrar LYIT and Principal, DNB Education Consultants
Ms. Ruth ní Bheoláin	Secretary	Quality Assurance Officer Hibernia College
Mr. Renaat Verbruggen	Subject Matter Expert	Department of Engineering Dublin City University
Mr. William Clutterbuck	Subject Matter Expert	Cybersecurity Consultant
Mr. Tjidde Maijer	Subject Matter Expert	Educational Coordinator and Lecturer in IT Rotterdam University

Ms. Aoife D'Arcy	Industry Expert	CEO of Krisolis
Ms. Angelina Jong	Learner Representative	

Section C.   Principal Programme

Names of centre(s) where the programme(s) is to be provided	Maximum number of learners (FT)	Maximum number of learners (PT)
Dublin Business School	90	90

Proposed Duration and Enrolment						
	First Intake Date	**Duration**	**Intakes per Annum**	**Enrolment i.e. learners per Intake**		
			Maximum	**Minimum**	**Maximum**	
Full-Time	September 2020	1 year	3	5	90	
Part-Time	September 2020	2 years	3	5	90	
Intake Schedule e.g. January September	September, January, March, April					

Section D.   Embedded Programme

Names of centre(s) where the programme(s) is to be provided	Maximum number of learners (FT)	Maximum number of learners (PT)
Dublin Business School	75	75

Proposed Duration and Enrolment						
	First Intake Date	**Duration**	**Intakes per Annum**	**Enrolment i.e. learners per Intake**		
			Maximum	**Minimum**	**Maximum**	
Full-Time	September 2020	1 year	3	5	75	
Part-Time	September 2020	2 years	3	5	75	
Intake Schedule e.g. January September	September, January, March, April					

Panel Commentary on proposed enrolment:

The provider notes the following clarification on proposed enrolment:

These numbers are indicative of our expected max and mins on intake but are subject to demand. There may be some flexibility in numbers across the two programmes as the Postgraduate Diploma in Science in Cybersecurity and Masters of Science in Cybersecurity students will sit in the same classroom and experience the same learning in the first 60 ECTS of the discipline-specific taught components. For example, we expect that there will be a maximum of 330 learners in total as an aggregate of the two programmes by third year of roll out. Also there will be no lower than 5 learners in any one cohort in a classroom and no more than 60 in a classroom or broadcast live lecture. For workshops, lab work and tutorial sessions (face to face or via Zoom), ratios as outlined in the Programme Document will be adhered to.

The Master's programme is designed to meet the growing need for Cybersecurity expertise throughout the workforce. Underlying this emergence is the need to prepare specialists across a range of work roles for the complexities associated with assuring the security of system operations from a holistic view. This programme aims at developing learners within the Cybersecurity discipline and involves theoretical knowledge and advanced skills in technology, communication information management, and processes to enable assured operations in the context of threat identification and mitigation. Learners develop advanced practical skills in essential areas such as programming, advanced databases, networks and systems administration, while also offering theoretical knowledge of cryptography and digital forensics. The programme also offers applied skills in contemporary topics such as software development, communications and networking security, and organisational and societal cybersecurity. The programme aims to incorporate practical skills in each module for the professional development of learners to enhance their employability options. This will enable the learner to integrate seamlessly into an organisation by addressing skills such as awareness of social media, leadership, self-management, teamwork and academic writing that are essential for a Level 9 graduate. It also includes an Applied Research Methods module, which focuses on research and development skills. This module will inform the development of the learner's Applied Research Project. It is a 1 year (3 semester) full-time, 18 months part-time programme with five 5 ECTS and four 10 ECTS taught modules, and a 25 ECTS Applied Research Project.

The Postgraduate Diploma in Science in Cybersecurity is an embedded award in the Master of Science in Cybersecurity. The Postgraduate Diploma may also be offered as a separate award, in its own right, and will be of interest to those who wish to complete the taught component only of this programme. This programme aims to develop learners within the Cybersecurity discipline with applied skills in technology, communication information management and related processes, in order to enable assured business operations in the context of threat identification and mitigation. Learners develop advanced practical skills in essential areas such as programming, advanced databases, networks and systems administration while also offering theoretical knowledge of cryptography and digital forensics. The programme also offers applied skills in contemporary topics such as software development, communications and networking security, and organisational and societal cybersecurity. The programme also incorporates professional development for learners to enhance their employability options. This will enable the learner to integrate seamlessly into an organisation by addressing skills such as awareness to social media, leadership, self-management, teamwork and academic writing that are essential for a Level 9 graduate. The duration of the postgraduate programme is two semesters full-time and three semesters part-time and is comprised of four taught modules of 5 ECTS along with four taught modules of 10 ECTS each.

Target learner groups

The Master of Science in Cybersecurity programme is aimed at learners with a minimum-second-class second-division (2.2) Level 8 honours bachelor's degree or Higher Diploma in a cognate area who wish to specialise in the field of cybersecurity with a view to entering industry. Cognate subjects include computer science, technology, networking, information systems, engineering, general science, mathematics, statistics, data analytics or related discipline. This programme may

also be of interest to those with a minimum second-class second-division (2.2) Level 8 honours bachelor's degree in a non-cognate area plus 3–5 years' professional experience in a related field and who require a qualification in this area in order to progress professionally. Such applicants will be assessed on a case-by-case basis. On completion of this programme, learners will have appropriate expertise to contribute in professional environments and effectively integrate their skills into cybersecurity solutions appropriate in their company. Through the applied research project, learners will develop independent research and problem-solving skills which will be valuable in a variety of contexts in the workplace.

The Postgraduate Diploma programme is aimed at learners with a minimum second-class second-division (2.2) Level 8 honours bachelor's degree or Higher Diploma in a cognate area who wish to specialise in the field of Artificial Intelligence with a view to entering industry. Cognate subjects include computer science, technology, networking, information systems, engineering, general science, mathematics, statistics, data analytics or related discipline. Learners with a minimum second-class second-division (2.2) Level 8 honours bachelor's degree in a non-cognate area plus 3–5 years' professional experience in a related field and who require a qualification in this area in order to progress professionally. Learners can also access this programme through RPL. Such applicants will be assessed on a case-by-case basis. On completion of this programme, learners will have the expertise to operate at a professional level and effectively integrate their skills into decision-making in their company.

Approved countries for provision	Ireland
Delivery mode: Full-time/Part-time	Full-time and part-time

The teaching and learning modalities
● Classroom lectures
● Case-based learning
● Practical skills sessions
● Workshops
● Tutorials
● Individual and group work
● Online synchronous and asynchronous classes

Summary of specifications for teaching staff		
Role	**Profile**	**WTE**
Lecturer	Lecturing staff will have a minimum of a Level 9 Postgraduate Diploma or Masters and/or PhD in the following areas: Mathematics, Statistics, Computer Science, Software Development, Computer Security, Information Systems, Data Analytics, and Database Development, Networks, Enterprise Information Systems, etc. In modules where industry experience is desirable, holders of Level 8 honours degrees in	

	the above disciplines, who are exceptionally qualified by virtue of significant senior industry experience may also be considered.	

Learning Activity	Staff : learner ratio
Lecture classroom-based sessions	1:60
Online class (broadcast live)	1:60
Online tutorial (interactive)	1:25
Practical Lab sessions	1:35
Workshops	1:25

Panel Commentary on programme outline and staffing:

Programmes being replaced (applicable to applications for revalidation)		
Code	**Title**	**Last enrolment date**
N/A	N/A	N/A

Section E.   Other noteworthy features of the application

Part 1A Evaluation of the Case for an Extension of the Approved Scope of Provision (where applicable). Having examined appropriate QA / Governance procedures, comment on the case for extending the applicant's Approved Scope of Provision to enable provision of this programme. (Especially relevant for move to online delivery / assessment)

DBS have already been approved by QQI for blended learning. It has already got Level 9 validation in the broad discipline of Computing and Data Analytics

Part 2.   Evaluation against the validation criteria

The panel should complete this section with commentary against each criterion to support the recommendation given in the 'Satisfactory?' column i.e. Yes, No, or Partially.

If 'Yes', there should be a comment citing the evidence for this finding. Likewise, there should be an explanation as to why the panel have concluded that the criterion has either not been met or only partially so.

Criterion 1.   The provider is eligible to apply for validation of the programme

a) The provider meets the prerequisites (section 44(7) of the 2012 Act) to apply for validation of the programme.
b) The application for validation is signed by the provider's chief executive (or equivalent) who confirms that the information provided is truthful and that all the applicable criteria have been addressed.
c) The provider has declared that their programme complies with applicable statutory, regulatory and professional body requirements.[1]

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.

DBS has self-declared that their programme complies with applicable statutory, regulatory and professional body requirement in their letter of application, a cover-letter signed by the Registrar confirms that the information provided is truthful and that all applicable criteria have been addressed and otherwise meets the prerequisites (section 44(7) of the 2012 Act) to apply for validation of the programme.

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[1] This criterion is to ensure the programme can actually be provided and will not be halted on account of breach of the law. The declaration is sought to ensure this is not overlooked but QQI is not responsible for verifying this declaration of enforcing such requirements.

Criterion 2. **The programme objectives and outcomes are clear and consistent with the QQI awards sought**

a) The programme aims and objectives are expressed plainly.
b) A QQI award is specified for those who complete the programme.
   (i) Where applicable, a QQI award is specified for each embedded programme.
c) There is a satisfactory rationale for the choice of QQI award(s).
d) The award title(s) is consistent with unit 3.1 of QQI's *Policy and Criteria for Making Awards.*
e) The award title(s) is otherwise legitimate for example it must comply with applicable statutory, regulatory and professional body requirements.
f) The programme title and any embedded programme titles are
   (i) Consistent with the title of the QQI award sought.
   (ii) Clear, accurate, succinct and fit for the purpose of informing prospective learners and other stakeholders.
g) For each programme and embedded programme
   (i) The **minimum intended programme learning outcomes** and any other educational or training objectives of the programme are explicitly specified.[2]
   (ii) The minimum intended programme learning outcomes to qualify for the QQI award sought are **consistent with** the relevant QQI awards standards.
h) Where applicable, the **minimum intended module learning outcomes** are explicitly specified for each of the programme's modules.
i) Any QQI minor awards sought for those who complete the modules are specified, where applicable.

For each minor award specified, the minimum intended module learning outcomes to qualify for the award are consistent with relevant QQI minor awards standards.[3]

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.

The panel is satisfied that the programme objectives and outcomes are clear and consistent with the QQI awards sought, at both Post-Graduate Diploma in Science and Master of Science levels, and that the programme aims and objectives, including minimum intended programme learning outcomes and module learning outcomes, are expressed plainly.

The titles "Master of Science in Cybersecurity" and "Postgraduate Diploma in Science in Cybersecurity" respectively, are suitable for the purposes of informing prospective learners and other stakeholders of the overall programme purpose.

The panel is also satisfied that programmes are consistent with the NFQ level 9 sought and that the minimum intended programme learning outcomes have been appropriately mapped to the level 9 QQI Award Standards for both Science and Computing.

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[2] Other programme objectives, for example, may be to meet the educational or training requirements of a statutory, regulatory or professional body.
[3] Not all modules will warrant minor awards. Minor awards feature strongly in the QQI common awards system however further education and training awards may be made outside this system.

Criterion 3. **The programme concept, implementation strategy, and its interpretation of QQI awards standards are well informed and soundly based (considering social, cultural, educational, professional and employment objectives)**

a) The development of the programme and the intended programme learning outcomes has sought out and taken into account the views of stakeholders such as learners, graduates, teachers, lecturers, education and training institutions, employers, statutory bodies, regulatory bodies, the international scientific and academic communities, professional bodies and equivalent associations, trades unions, and social and community representatives.[4]
b) The interpretation of awards standards has been adequately informed and researched; considering the programme aims and objectives and minimum intended programme (and, where applicable, modular) learning outcomes.
   (i) There is a satisfactory rationale for providing the programme.
   (ii) The proposed programme compares favourably with existing related (comparable) programmes in Ireland and beyond. Comparators should be as close as it is possible to find.
   (iii) There is support for the introduction of the programme (such as from employers, or professional, regulatory or statutory bodies).
   (iv) There is evidence[5] of learner demand for the programme.
   (v) There is evidence of employment opportunities for graduates where relevant[6].
   (vi) The programme meets genuine education and training needs.[7]
c) There are mechanisms to keep the programme updated in consultation with internal and external stakeholders.
d) Employers and practitioners in the cases of vocational and professional awards have been systematically involved in the programme design where the programme is vocationally or professionally oriented.
e) The programme satisfies any validation-related criteria attaching to the applicable awards standards and QQI awards specifications.

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.

The panel is satisfied that the programme concept, implementation strategy, and its interpretation of QQI awards standards were developed in direct liaison with industry and has been developed with an industry focus in mind.

DBS has a broad range of programmes across various disciplines from computing, law, humanities but have significant experience in computing programmes specifically. In the 2019/20 academic year, 1229 students were studying computing or ICT related programmes of which 734 learners were completing data and business analytics related programme across levels 6-9 and some unaccredited

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[4] Awards standards however detailed rely on various communities for their interpretation. This consultation is necessary if the programme is to enable learners to achieve the standard in its fullest sense.
[5] This might be predictive or indirect.
[6] It is essential to involve employers in the programme development and review process when the programme is vocationally or professionally oriented.
[7] There is clear evidence that the programme meets the **target learners'** education and training needs and that there is a clear demand for the programme.

programmes. Programmes are developed with a clear focus on industry and societal needs as evidenced in reporting needs. Industry advisory boards are established to advise on industry relevance of programmes. The provider spoke to how effective engagement with stakeholders is a priority across the College. Engagement with industry stakeholders was further evidenced in "Appendix 6 Stakeholder feedback on completed programme".

The programmes were developed to address skills gaps and as a potential candidate for future programme government funding. There is strong indicated interest from international markets, which may be impacted by Covid-19, but strongly evidence demand for these programmes. The programmes fit well within both the institutional and national strategic priorities. Creating work-ready graduates is a priority, deliver outstanding learning and support student success and enhance the learning experience.

Criterion 4. The programme's access, transfer and progression arrangements are satisfactory

a) The information about the programme as well as its procedures for access, transfer and progression are consistent with the procedures described in QQI's policy and criteria for access, transfer and progression in relation to learners for providers of further and higher education and training. Each of its programme-specific criteria is individually and explicitly satisfied[8].

b) Programme information for learners is provided in plain language. This details what the programme expects of learners and what learners can expect of the programme and that there are procedures to ensure its availability in a range of accessible formats.

c) If the programme leads to a higher education and training award and its duration is designed for native English speakers, then the level of proficiency in English language must be greater or equal to B2+ in the Common European Framework of Reference for Languages (CEFRL[9]) in order to enable learners to reach the required standard for the QQI award.

d) The programme specifies the learning (knowledge, skill and competence) that **target learners** are expected to have achieved before they are enrolled in the programme and any other assumptions about enrolled learners (programme participants).

e) The programme includes suitable procedures and criteria for the **recognition of prior learning** for the purposes of access and, where appropriate, for advanced entry to the programme and for exemptions.

f) The programme title (the title used to refer to the programme):-
   (i) Reflects the core *intended programme learning outcomes*, and is consistent with the standards and purposes of the QQI awards to which it leads, the award title(s) and their class(es).
   (ii) Is learner focused and meaningful to the learners;
   (iii) Has long-lasting significance.

g) The programme title is otherwise legitimate; for example, it must comply with applicable statutory, regulatory and professional body requirements.

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Partially	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that programme partially meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Partially	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that programme partially meets this criterion.

The panel is satisfied that programme information provided to learners is sufficient and provided in plain language, that minimum English language proficiency is implemented and that the programme titles are compliant with long-lasting significance and meaning for learners.

The panel noted that a strong baseline of programming and database competency would be required to engage competently in the cybersecurity discipline. Panel queried if 10 ECTs is enough to

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[8] Each of the detailed criteria set out in the Policy and criteria for access, transfer and progression in relation to learners for providers of further and higher education and training must be addressed in the provider's evaluation report. The detailed criteria   are (QQI, restated 2015) arranged under the headings
- Progression and transfer routes
- Entry arrangements
- Information provision

[9] http://www.coe.int/t/dg4/linguistic/Source/Framework_EN.pdf (accessed 26/09/2015)

embed the programming skill-set and to develop core competencies. The provider noted that the data-analytics programme has previously attracted technically minded and experienced applicants and consequently competency in these areas had not been an issue previously. Due to the implicit assumption that applicants will have prior experience in these areas, the panel noted that this prior knowledge be explicitly outlined as part of the entry requirements for the programme.

The panel discussed the viability of any programme that commenced with the minimum stated intake of five learners and queried whether it was an appropriate number to assure the learner experience. Difficulties for group-work and student progression were noted where the overall intake could fall below five if a student or multiple students presented with mitigating circumstances. The panel accepted the provider's rationale for assuring the learning experience and their dedication to providing ongoing learner support but noted that the absolute minimum numbers be revisited in light of panel discussions.

The panel noted that due to provider restrictions around advanced entry, students who opt to exit with the post-graduate diploma cannot currently return to complete their dissertation and achieve the overall MSc Award. The panel recommend that the College review its procedures in relation to ATP to facilitate a pathway for students who may wish to return to complete their dissertation later.

Criterion 5. The programme's written curriculum is well structured and fit-for-purpose

a) The programme is suitably structured and coherently oriented towards the achievement by learners of its intended programme learning outcomes. The programme (including any stages and modules) is integrated in all its dimensions.

b) In so far as it is feasible the programme provides choice to enrolled learners so that they may align their learning opportunities towards their individual educational and training needs.

c) Each module and stage is suitably structured and coherently oriented towards the achievement by learners of the intended *programme* learning outcomes.

d) The objectives and purposes of each of the programme's elements are clear to learners and to the provider's staff.

e) The programme is structured and scheduled realistically based on sound educational and training principles[10].

f) The curriculum is comprehensively and systematically documented.

g) The credit allocated to the programme is consistent with the difference between the entry standard and minimum intended programme learning outcomes.

h) The credit allocated to each module is consistent with the difference between the module entry standard and minimum intended module learning outcomes.

i) Elements such as practice placement and work-based phases are provided with the same rigour and attentiveness as other elements.

j) The programme duration (expressed in terms of time from initial enrolment to completion) and its fulltime equivalent contact time (expressed in hours) are consistent with the difference between the minimum entry standard and award standard and with the credit allocation.[11]

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Partially	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that programme partially meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Partially	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that programme partially meets this criterion.

The panel is broadly satisfied that the programme's written curriculum is well structured and fit-for-purpose but noted that the proposed programmes are ambitious in what they are trying to achieve in a short period of time with a broad spectrum of topics to be covered.

The provider spoke to future proofing of the programmes with strong ties to industry connected to the industry advisory boards established for each discipline within the College. An overall employer engagement board within the College governs the activity of these oversight groups to ensure feedback is appropriately actioned in the ongoing review and development of programmes.

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[10] This applies recursively to each and every element of the programme from enrolment through to completion.
In the case of a modular programme, the pool of modules and learning pathway constraints (such as any prerequisite and co-requisite modules) is explicit and appropriate to the intended programme learning outcomes.

[11] If the duration is variable, for example, when advanced entry is available, this should be explained and justified

The panel noted that the curricula of the proposed programmes are quite theoretical and queried the integration of real-world applications of the programmes where students would get the opportunity to translate theory into action. The panel emphasised the importance of giving students the opportunity to embed their skills in real-world scenarios and if the has been considered. The course director and individual module leaders spoke to the integration of real-world learning in teaching, learning and assessment opportunities throughout the programme. The panel was satisfied that this was sufficiently spoken to during the panel visit but recommended that this be made explicit throughout the programme documentation.

Criterion 6. There are sufficient qualified and capable programme staff available to implement the programme as planned

> a) The specification of the programme's staffing requirements (staff required as part of the programme and intrinsic to it) is precise, and rigorous and consistent with the programme and its defined purpose. The specifications include professional and educational qualifications, licences-to-practise where applicable, experience and the staff/learner ratio requirements. See also criterion 12 c).
> b) The programme has an identified complement of staff[12] (or potential staff) who are available, qualified and capable to provide the specified programme in the context of their existing commitments.
> c) The programme's complement of staff (or potential staff) (those who support learning including any employer-based personnel) are demonstrated to be competent to enable learners to achieve the intended programme learning outcomes and to assess learners' achievements as required.
> d) There are arrangements for the performance of the programme's staff to be managed to ensure continuing capability to fulfil their roles and there are staff development[13] opportunities[14].
> e) There are arrangements for programme staff performance to be reviewed and there are mechanisms for encouraging development and for addressing underperformance.
> f) Where the programme is to be provided by staff not already in post there are arrangements to ensure that the programme will not enrol learners unless a complement of staff meeting the specifications is in post.

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.

The panel is satisfied that there are sufficient qualified and capable programme staff available to implement the programme as planned based on the specific requirements set out in section 7 of the proposed validation document, module descriptors and the attached 'Appendix 2 Programme Team CVs'.

Both programmes are staffed with existing staff and no new hires are anticipated at the outset of programme delivery. At present, the College employs 300 academic staff, a third of whom are full-time. It is anticipated that two modules leaders will be appointed per module and that additional staff will be hired if required as the programme scales. The panel recommended that the provider clarify within the documentation how additional staffing needs would be identified and resourced as

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[12] Staff here means natural persons required as part of the programme and accountable (directly or indirectly) to the programme's provider, it may for example, include contracted trainers and workplace supervisors.

[13] Development here is for the purpose of ensuring staff remain up-to-date on the discipline itself, on teaching methods or on other relevant skills or knowledge, to the extent that this is necessary to ensure an adequate standard of teaching.

[14] Professional or vocational education and training requires that teaching staff's professional/vocation knowledge is up to date. Being qualified in a discipline does not necessarily mean that a person is currently competent in that discipline. Therefore, performance management and development of professional and vocational staff needs to focus on professional/vocational competence as well as pedagogical competence. Professional development may include placement in industry, for example. In regulated professions it would be expected that there are a suitable number of registered practitioners involved.

the programmes grow, with particular reference to the requirement for research project supervision.

Staff receive ongoing support and training in relation to their roles in line with the College's Staff Development Policy included in the Quality Assurance Handbook. As referenced in section 7 of the programme document, academic staff are managed by faculty managers and systematic feedback is gathered on teaching performance via class reps and student survey which is part of the overall programme monitoring and review.

Criterion 7. There are sufficient physical resources to implement the programme as planned

a) The specification of the programme's physical resource requirements (physical resources required as part of the programme and intrinsic to it) is precise, and rigorous and consistent with the programme, its defined purpose and its resource/learner-ratio requirements. See also criterion 12 d).

b) The programme has an identified complement of supported physical resources (or potential supported physical resources) that are available in the context of existing commitments on these e.g. availability of:
   (i) suitable premises and accommodation for the learning and human needs (comfort, safety, health, wellbeing) of learners (this applies to all of the programme's learning environments including the workplace learning environment)
   (ii) suitable information technology and resources (including educational technology and any virtual learning environments provided)
   (iii) printed and electronic material (including software) for teaching, learning and assessment
   (iv) suitable specialist equipment (e.g. kitchen, laboratory, workshop, studio) – if applicable
   (v) technical support
   (vi) administrative support
   (vii) company placements/internships – if applicable

c) If versions of the programme are provided in parallel at more than one location each independently meets the location-sensitive validation criteria for each location (for example staffing, resources and the learning environment).

d) There is a five-year plan for the programme. It should address
   (i) Planned intake (first five years) and
   (ii) The total costs and income over the five years based on the planned intake.

e) The programme includes controls to ensure entitlement to use the property (including intellectual property, premises, materials and equipment) required.

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.

The panel is satisfied that there are sufficient physical resources to implement the programme as planned. Physical resources requirements are outlined in section 8 of the proposed programme validation document. The panel is additionally satisfied that there are sufficient resources and systems in place to protect and support learners and the quality of their learning experiences. This includes robust training, development and governance procedures put in place to assure the quality of learning experience in response to Covid-19.

The College has substantial physical capacity, outlined in section 8 of the programme documentation, including classrooms space and 12 dedicated IT labs with 400 seats. A physical library is complemented by an extensive online library collection. Resources and programme materials are provided to learners through the Virtual Learning Environment and they also have access to free printing facilitates on campus.

Criterion 8. The learning environment is consistent with the needs of the programme's learners

a) The programme's physical, social, cultural and intellectual environment (recognising that the environment may, for example, be partly virtual or involve the workplace) including resources and support systems are consistent with the intended programme learning outcomes.

b) Learners can interact with, and are supported by, others in the programme's learning environments including peer learners, teachers, and where applicable supervisors, practitioners and mentors.

c) The programme includes arrangements to ensure that the parts of the programme that occur in the workplace are subject to the same rigours as any other part of the programme while having regard to the different nature of the workplace.

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.

The panel is satisfied that the learning environment is consistent with the needs of the programme's learners. Physical and virtual learning resources are extensive and under continuous review and development, students are supported to engage in social activities through the SU and a peer mentoring system is also in place.

Two dedicated departments, the Student Engagement and Success Unit and the Student Experience Team, provide significant support to learners and work in tandem to organise robust induction and orientation programmes**.**

Criterion 9. There are sound teaching and learning strategies

a)	The teaching strategies support achievement of the intended programme/module learning outcomes.
b)	The programme provides authentic learning opportunities to enable learners to achieve the intended programme learning outcomes.
c)	The programme enables enrolled learners to attain (if reasonably diligent) the minimum intended programme learning outcomes reliably and efficiently (in terms of overall learner effort and a reasonably balanced workload).
d)	Learning is monitored/supervised.
e)	Individualised guidance, support15 and timely formative feedback is regularly provided to enrolled learners as they progress within the programme.

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Partially	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that programme partially meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Partially	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that programme partially meets this criterion.

The panel is satisfied that there are sound teaching and learning strategies in place in the programme that align to DBS's overarching TLA strategy. Learning is appropriately monitored and supported, and a breakdown of learner effort required to achieve the learning outcomes clearly set out in the proposed programme schedule and individual module descriptors. The panel queried the operationalisation of directed e-learning hours which account for 20% of module contact hours, excluding the dissertation module in the MSc programme, and would suggest that a plan be put in place to specifically address these hours.

The panel noted that there are distributed references to law and ethics throughout the proposed programme documentation and queried whether it would be pertinent to have a dedicated module or at least larger specific component dedicated to these areas. Following discussion, the panel was satisfied with the provider's rationale for this distributed approach but recommended that ethics in particular be made explicit within the programmes' MIPLOs, MIMLOs and assessment.

The panel discussed the important of social engineering in the application of the skills acquired in these programmes and advised that these elements of the programme be clearly articulated in the programme MIPLOs.

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[15] Support and feedback concerns anything material to learning in the context of the programme. For the avoidance of doubt it includes among other things any course-related language, literacy and numeracy support.

Criterion 10.   There are sound assessment strategies

a) All assessment is undertaken consistently with *Assessment Guidelines, Conventions and Protocols for Programmes Leading to QQI Awards*[16]

b) The programme's assessment procedures interface effectively with the provider's QQI approved quality assurance procedures.

c) The programme includes specific procedures that are fair and consistent for the assessment of enrolled learners to ensure the minimum intended programme/module learning outcomes are acquired by all who successfully complete the programme.[17]

d) The programme includes formative assessment to support learning.

e) There is a satisfactory written **programme assessment strategy** for the programme as a whole and there are satisfactory module assessment strategies for any of its constituent modules.[18]

f) Sample assessment instruments, tasks, marking schemes and related evidence have been provided for each award-stage assessment and indicate that the assessment is likely to be valid and reliable.

g) There are sound procedures for the moderation of summative assessment results.

h) The provider only puts forward an enrolled learner for certification for a particular award for which a programme has been validated if they have been specifically assessed against the standard for that award.[19]

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Partially	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that programme partially meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Partially	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that programme partially meets this criterion.

The panel is satisfied that assessment is undertaken consistently in line with QQI assessment requirements, that assessment is appropriately aligned to the College's QA procedures and that systems are in place to ensure fair and consistent assessment of learners including the provision of assessment schedules, sample assessment materials and grading rubrics.

The panel recommended the College give significant thought to how protected learning opportunities will be provided to learners to test skills that need to be tested in secure, isolated and contained environments without risking organisational infrastructure. It was noted that these may be particularly challenging to support in remote learning situations due to restrictions imposed by many cloud providers.

The panel queried opportunities for students to receive formative feedback in advance of submitting final summative assessment. The course director spoke to a robust ethos of providing formative

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[16] See the section on transitional arrangements.

[17] This assumes the minimum intended programme/module learning outcomes are consistent with the applicable awards standards.

[18] The programme assessment strategy is addressed in the Assessment Guidelines, Conventions and Protocols for Programmes Leading to QQI Awards. See the section on transitional arrangements.

[19] If the award is a QQI CAS compound award it is not necessarily sufficient that the learner has achieved all the components specified in the certification requirements unless at least one of those components is a capstone component (i.e. designed to test the compound learning outcomes).

feedback to all students which is strongly encouraged across all programmes and that there is continued work underway to assure consistency of this feedback for all students.

The panel recommended that the College review assessment outlines to provide more detailed summaries of assessment requirements, provide additional detail in relation to academic integrity in continuous assessment, and that rubrics be reviewed with a view to giving more marks to design processes where relevant. Group work policies should be clearly articulated to ensure clarity for learners.

The provider spoke to strong industry collaboration links in relation to research projects where industry connections are encouraged to present projects that could be completed for students' dissertations that the panel recommended be more clearly articulated within the documentation.

Criterion 11. Learners enrolled on the programme are well informed, guided and cared for

a) There are arrangements to ensure that each enrolled learner is fully informed in a timely manner about the programme including the schedule of activities and assessments.
b) Information is provided about learner supports that are available to learners enrolled on the programme.
c) Specific information is provided to learners enrolled on the programme about any programme-specific appeals and complaints procedures.
d) If the programme is modular, it includes arrangements for the provision of effective guidance services for learners on the selection of appropriate learning pathways.
e) The programme takes into account and accommodates to the differences between enrolled learners, for example, in terms of their prior learning, maturity, and capabilities.
f) There are arrangements to ensure that learners enrolled on the programme are supervised and individualised support and due care is targeted at those who need it.
g) The programme provides supports for enrolled learners who have special education and training needs.
h) The programme makes reasonable accommodations for learners with disabilities[20].
i) If the programme aims to enrol international students it complies with the *Code of Practice for Provision of Programmes to International Students*[21] and there are appropriate in-service supports in areas such as English language, learning skills, information technology skills and such like, to address the particular needs of international learners and enable such learners to successfully participate in the programme.
j) The programme's learners will be well cared for and safe while participating in the programme, (e.g. while at the provider's premises or those of any collaborators involved in provision, the programme's locations of provision including any workplace locations or practice-placement locations).

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.

The College's Head of Student Experience and Student Engagement Officer spoke to robust student support systems in the College including an established Student Engagement & Success Unit as outlined in 'Appendix 8 Student Experience, Support and Engagement'. A detailed induction programme is provided for all learners with a particular focus on international learners. Mental Health supports were emphasised and are benchmarked by the College against UK standards for Mental Health in higher education, in the absence of a similar national standard here.

Information on appeals and complaints procedures is available in the Quality Assurance Handbook which is available on the DBS website and in Moodle. Programme coordinators and course directors also have a distinct pastoral role to support learners as evidenced through panel discussions.

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[20] For more information on making reasonable accommodations see www.AHEAD.ie and QQI's Policies, Actions and Procedures for Access, Transfer and Progression for Learners (QQI, restated 2015).
[21] See Code of Practice for Provision of Programmes to International Students (QQI, 2015)

Criterion 12.   The programme is well managed

> a) The programme includes intrinsic governance, quality assurance, learner assessment, and access, transfer and progression procedures that functionally interface with the provider's general or institutional procedures.
>
> b) The programme interfaces effectively with the provider's QQI approved quality assurance procedures. Any proposed incremental changes to the provider's QA procedures required by the programme or programme-specific QA procedures have been developed having regard to QQI's statutory QA guidelines. If the QA procedures allow the provider to approve the centres within the provider that may provide the programme, the procedures and criteria for this should be fit-for-the-purpose of identifying which centres are suited to provide the programme and which are not.
>
> c) There are explicit and suitable programme-specific criteria for selecting persons who meet the programme's staffing requirements and can be added to the programme's complement of staff.
>
> d) There are explicit and suitable programme-specific criteria for selecting physical resources that meet the programmes physical resource requirements, and can be added to the programme's complement of supported physical resources.
>
> e) Quality assurance[22] is intrinsic to the programme's maintenance arrangements and addresses all aspects highlighted by the validation criteria.
>
> f) The programme-specific quality assurance arrangements are consistent with QQI's statutory QA guidelines and use continually monitored completion rates and other sources of information that may provide insight into the quality and standards achieved.
>
> g) The programme operation and management arrangements are coherently documented and suitable.
>
> h) There are sound procedures for interface with QQI certification.

Programme	Satisfactory? (yes, no, partially)	Comment
Master of Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.
Postgraduate Diploma in Science in Cybersecurity	Yes	The panel has evaluated the programme having regard to the criterion and sub-criteria and recommends that QQI can be satisfied that the programme meets this criterion.

The panel is satisfied that the proposed programmes are well managed and supported by DBS' established QA procedures approved through reengagement with QQI in 2019. The college's Quality Assurance Handbook is published on the DBS website and available to learners via the Virtual Learning Environment. Governance and QA policies and procedures are detailed in the Quality Assurance Handbook and an overview of the governance and management structure of the College is provided in Section 1 of the programme documentation also.

Procedures for recruitment of staff are detailed in the Quality Assurance Handbook. Specific teaching and qualification requirements are provided in the individual module descriptors. Additionally, an established Academic Appointments Sub-Committee of the Academic Board approves all new academic staff and periodically reviews all appointments.

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[22] See also QQI's Policy on Monitoring (QQI, 2014)

Part 3. Overall recommendation to QQI

3.1 Principal programme: Master of Science in Cybersecurity

Select one	
	Satisfactory (meaning that it recommends that QQI can be satisfied in the context of unit 2.3) of Core policies and criteria for the validation by QQI of programmes of education and training;
X	Satisfactory subject to proposed special conditions (specified with timescale for compliance for each condition; these may include proposed pre-validation conditions i.e. proposed (**minor**) things to be done to a programme that almost fully meets the validation criteria before QQI makes a determination);
	Not satisfactory.

Reasons for the overall recommendation
1.

Commendations
1. The panel would like to commend DBS on the quality and comprehensive nature of the documentation presented.
2. The panel would like to commend DBS on their comprehensive mental health supports and resourcing of student support overall including provisions to support international learners.

Special Conditions of Validation (directive and with timescale for compliance)
As per summary of recommended special conditions of validation.

Embedded programme: Postgraduate Diploma in Science in Cybersecurity

Select one	
	Satisfactory (meaning that it recommends that QQI can be satisfied in the context of unit 2.3) of Core policies and criteria for the validation by QQI of programmes of education and training;
X	Satisfactory subject to proposed special conditions (specified with timescale for compliance for each condition; these may include proposed pre-validation conditions i.e. proposed (**minor**) things to be done to a programme that almost fully meets the validation criteria before QQI makes a determination);
	Not satisfactory.

Reasons for the overall recommendation
1.

Commendations
1. The panel would like to commend DBS on the quality and comprehensive nature of the documentation presented.
2. The panel would like to commend DBS on their comprehensive mental health supports and resourcing of student support overall including provisions to support international learners.

Special Conditions of Validation (directive and with timescale for compliance)
As per summary of recommended special conditions of validation.

Summary of recommended special conditions of validation

1) Real-world application of knowledge, skills and competencies to be identified, and applied in the learning objectives, throughout the modules.
2) Consider the breakdown of grading criteria and consideration of academic integrity in relation to exams and also group work.
3) Provide a more detailed breakdown of assessment components in particular modules such as NLP and research methods.
4) Make ethics explicit in MIPLOs, MIMLOs and assessment.
5) Review entry requirements in relation to prior knowledge of programming and databases and review related module content accordingly.
6) Review how the social engineering elements of the programme are articulated in the MIPLOs

Summary of recommendations to the provider

1) Recommend reconsidering the minimum number of learners per cohort to assure continuity of the learner experience where numbers fall below those specified.
2) Revisit institutional policies in relation to students returning to complete dissertations having received exit awards previously.
3) Explicitly articulate the role of industry connections and liaison in relation to keeping programmes updated in terms of up to date content and in areas such as the research dissertation module.

Declarations of Evaluators' Interests

NONE

This report has been agreed by the evaluation panel and is signed on their behalf by the chairperson.

Panel chairperson: Date: 21 August 2020

               Danny Brennan

3.2   Disclaimer

The Report of the External Review Panel contains no assurances, warranties or representations express or implied, regarding the aforesaid issues, or any other issues outside the Terms of Reference.

While QQI has endeavoured to ensure that the information contained in the Report is correct, complete and up-to-date, any reliance placed on such information is strictly at the reader's own risk, and in no event will QQI be liable for any loss or damage (including without limitation, indirect or

consequential loss or damage) arising from, or in connection with, the use of the information contained in the Report of the External Evaluation Panel.

Name of Provider:	Dublin Business School
Programme Title	Master of Science in Cybersecurity
Award Title	Master of Science
Stage Exit Award Title	Postgraduate Diploma in Science in Cybersecurity
Modes of Delivery (FT/PT):	Full-time
Teaching and learning modalities	various

Award Class	Award NFQ level	Award EQF Level	Stage (1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level	Stage EQF Level	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major	9	7	Award	9	7	90	Sept 2020	0611

Module Title (Up to 70 characters including spaces)	Semester no where applicable. (Semester 1 or Semester2)	Module		Credit Number	Total Student Effort Module (hours)					Allocation Of Marks (from the module assessment strategy)			
		Status	NFQ Level where specified	Credit Number	Total Hours	Class (or equiv) Contact Hours	Directed e-learning	Hours of Independent Learning	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam %
Advanced Programming Techniques	1	M	9	10	250	48	50	152		100			
Advanced Databases	1	M	9	5	125	24	25	76			50		50
Networks and Systems Administration	1	M	9	5	125	24	25	76		60			40
Cryptography & Digital Forensics	1	M	9	10	250	48	50	152		70			30
Communications and Networking Security	2	M	9	10	250	48	50	152			100		
Cybersecurity for Software Development	2	M	9	5	125	24	25	76		100			
Penetration Testing and Business Continuity Management	2	M	9	5	125	24	25	76		100			
Organisational and Societal Cybersecurity	2	M	9	10	250	48	50	152		100			
Applied Research Methods	2	M	9	5	125	24	25	76		100			
Applied Research Project	3	M	9	25	625	12		613		100			
Special Regulations (Up to 280 characters)													

Name of Provider:	Dublin Business School
Programme Title	Master of Science in Cybersecurity
Award Title	Master of Science
Stage Exit Award Title	Postgraduate Diploma in Science in Cybersecurity
Modes of Delivery (FT/PT):	Part-time
Teaching and learning modalities	various

Award Class	Award NFQ level	Award EQF Level	Stage (1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level	Stage EQF Level	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major	9	7	Award	9	7	90	Sept 2020	0611

Module Title (Up to 70 characters including spaces)	Semester no where applicable. (Semester 1 or Semester2)	Module		Credit Number	Total Student Effort Module (hours)					Allocation Of Marks (from the module assessment strategy)			
		Status	NFQ Level where specified	Credit Units	Total Hours	Class (or equiv) Contact Hours	Directed e-learning	Hours of Independent Learning	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam %
Advanced Programming Techniques	1	M	9	10	250	36	62	152		100			
Advanced Databases	1	M	9	5	125	18	31	76		50			50
Networks and Systems Administration	1	M	9	5	125	18	31	76		60			40
Cryptography & Digital forensics	2	M	9	10	250	36	62	152		70			30
Communications and Networking Security	2	M	9	10	250	36	62	152			100		
Cybersecurity for Software Development	3	M	9	5	125	18	31	76		100			
Penetration Testing and Business Continuity Management	3	M	9	5	125	18	31	76		100			
Organisational and Societal Cybersecurity	3	M	9	10	250	36	62	152		100			
Applied Research Methods	3	M	9	5	125	18	31	76		100			
Applied Research Project	4	M	9	25	625	12		613		100			
Special Regulations (Up to 280 characters)													

Name of Provider:	Dublin Business School
Programme Title	Postgraduate Diploma in Science in Cybersecurity
Award Title	Postgraduate Diploma in Science in Cybersecurity
Stage Exit Award Title	N/A
Modes of Delivery (FT/PT):	Full-time
Teaching and learning modalities	various

Award Class	Award NFQ level	Award EQF Level	Stage (1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level	Stage EQF Level	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major	9	7	Award	9	7	90	Sept 2020	0611

Module Title (Up to 70 characters including spaces)	Semester no where applicable. (Semester 1 or Semester2)	Status	NFQ Level where specified	Credit Units	Total Hours	Class (or equiv) Contact Hours	Directed e-learning	Hours of Independent Learning	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam %
Advanced Programming Techniques	1	M	9	10	250	48	50	152		100			
Advanced Databases	1	M	9	5	125	24	25	76			50		50
Networks and Systems Administration	1	M	9	5	125	24	25	76		60			40
Cryptography & Digital forensics	1	M	9	10	250	48	50	152		70			30
Communications and Networking Security	2	M	9	10	250	48	50	152			100		
Cybersecurity for Software Development	2	M	9	5	125	24	25	76		100			
Penetration Testing and Business Continuity Management	2	M	9	5	125	24	25	76		100			
Organisational and Societal Cybersecurity	2	M	9	10	250	48	50	152		100			
Special Regulations (Up to 280 characters)													

Postgraduate Diploma in Science in Cybersecurity – Part-time

Name of Provider:	Dublin Business School
Programme Title	Postgraduate Diploma in Science in Cybersecurity
Award Title	Postgraduate Diploma
Stage Exit Award Title	N/A
Modes of Delivery (FT/PT):	Part-time
Teaching and learning modalities	various

Award Class	Award NFQ level	Award EQF Level	Stage (1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level	Stage EQF Level	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major	9	7	Award	9	7	90	Sept 2020	0611

Module Title (Up to 70 characters including spaces)	Semester no where applicable. (Semester 1 or Semester2)	Module		Credit Number	Total Student Effort Module (hours)					Allocation Of Marks (from the module assessment strategy)			
		Status	NFQ Level where specified	Credit Units	Total Hours	Class (or equiv) Contact Hours	Directed e-learning	Hours of Independent Learning	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam %
Advanced Programming Techniques	1	M	9	10	250	36	62	152		100			
Advanced Databases	1	M	9	5	125	18	31	76			50		50
Networks and Systems Administration	1	M	9	5	125	18	31	76		60			40
Cryptography & Digital forensics	2	M	9	10	250	36	62	152		70			30
Communications and Networking Security	2	M	9	10	250	36	62	152			100		
Cybersecurity for Software Development	3	M	9	5	125	18	31	76		100			
Penetration Testing and Business Continuity Management	3	M	9	5	125	18	31	76		100			
Organisational and Societal Cybersecurity	3	M	9	10	250	36	62	152		100			
Special Regulations (Up to 280 characters)													