

Pearson

BTEC Higher National

qualifications in Computing

Specification

First Teaching from September 2022

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Issue 6

Pearson BTEC Level 4
Higher National Certificate

Pearson BTEC Level 5
Higher National Diploma

Edexcel, BTEC and LCCI qualifications

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Summary of changes in Pearson BTEC Higher Nationals in Computing Issue 6

Summary of changes made between previous issue and this current issue		
Unit Number	Unit Name	Summary of Changes
1	Programming	Essential Content: minor additions to LO1, LO2 and LO3 to align with IfATE occupational standards mapping. Update to AC to ensure scaffolding.
2	Networking	Essential Content: Clarification of wording and content additions align with vendor certification mapping and with IfATE occupational standards mapping Updates to assessment criteria for clarity and appropriate scaffolding.
3	Professional Practice	Essential Content: Clarification of wording and content added to LO1, LO2 and LO3, to align with IfATE occupational standards mapping Minor updates to assessment criteria for clarity.
4	Database design and development	Essential Content: Clarification and unpacking of content in LO1, LO2, LO3, LO4, to align with IfATE occupational standards mapping Minor update to P5 and M5 to ensure appropriate scaffolding.
5	Security	Essential Content: Minor content added LO1, LO3, LO4, to align with vendor certificates and for IfATE occupational standards mapping Changes to some assessment criteria for clarity and better scaffolding.
6	Planning Computing Project	Unit updated: Name changed from Managing a Successful Computing Project. Introduction updated. All LO's refined, re-organised or new. Assessment criteria updated, and essential content refocussed.

7	Software Development Lifecycles	Essential Content: Content additions and unpacking of existing content to LO1, LO2 and LO3 to align with IfATE occupational standards mapping
8	Data Analytics	Essential Content: Minor content addition to LO2 to align with IfATE occupational standards mapping
9	Computer Systems Architecture	Essential Content: Minor addition to LO3 to align with IfATE occupational standards mapping
11	Strategic Information Systems	Essential Content: Content additions to LO3 to align with IfATE occupational standards mapping
13	Website Design & Development	Minor content additions to LO1 Content additions to LO2 and LO3 M1 and M3 command verbs changed for appropriate scaffolding.
16	Research Project	Essential Content: Minor content addition to LO1, LO2 and LO3 to align with IfATE occupational standards mapping.
17	Business intelligence (Business Process Support)	Unit Updated: Title changed to ' Business Process Support' and introduction updated to reflect this. Update to all LO's and AC. Essential content has been refreshed and re-organised but underlying topics are the same.
18	Discrete Maths	Essential Content: Minor language corrections.
19	Data Structures & Algorithms	Essential Content: Minor content additions to LO3 to align with IfATE requirements.
21	Application Program Interfaces	All LO's updated to reflect the improvements to the assessment criteria Assessment criteria reworded and/or updated Additions to Essential Content for the purposes of vendor mapping and occupational standards alignment.
22	Application Development	Essential Content: Content additions to LO3 to align with IfATE occupational mapping.

23	Risk Analysis & Systems Testing	Essential Content: Content additions to LO1, LO2, LO3 and LO4 to align with IfATE occupational mapping. P8 command verb changed.
27	Transport Network Design	Essential Content: Updated introduction Content addition to all LO's to align with IfATE occupational standards mapping
28	Cloud Computing	Essential Content: Content additions to LO1, LO2 and LO3 to align with IfATE occupational standards mapping.
29	Network Security	Essential Content: Content addition and unpacking of previous content to all LO's to align with IfATE occupational standards mapping. Update to some AC appropriate scaffolding and command verbs.
31	Forensics	Essential Content: Content additions to LO3, LO4 to align with IfATE occupational mapping. Update of command verbs on a few AC.
32	Information Security Management	Essential Content: Content additions to LO1, LO3, LO4 to align with IfATE occupational mapping. Update of command verbs on a few AC.
39	Network Management	Essential Content: Content additions to LO1, LO2 and LO4 to align with IfATE occupational mapping.
45	Internet of Things	Essential Content: Content additions to LO1 to align with IfATE occupational mapping.
50	Operating Systems	Essential Content: Content additions to LO1, LO2 and LO3 to align with IfATE occupational mapping and vendor certification
54	Prototyping	Essential Content: Content additions to LO1 and LO2 to align with IfATE occupational mapping. Update of command verb on P7.

If you need further information on these changes or what they mean, contact us via our website at: qualifications.pearson.com/en/support/contact-us.html.

Contents

1	Introduction	1
1.1	The Student Voice	1
1.2	Why choose Pearson BTEC Higher Nationals?	1
1.3	HN Global	2
1.4	Qualification titles	3
1.5	Qualification codes	3
1.6	Awarding institution	3
1.7	Key features	3
1.8	Collaborative development	4
2	Programme purpose and objectives	6
2.1	Purpose of the Pearson BTEC Higher Nationals in Computing	6
2.2	Objectives of the Pearson BTEC Higher Nationals in Computing	6
2.3	Aims of the Pearson BTEC Level 4 Higher National Certificate in Computing	7
2.4	Aims of the Pearson BTEC Level 5 Higher National Diploma in Computing	8
2.5	Use of Maths and English within the curriculum	9
2.6	The Skills Framework for the Information Age (SFIA)	9
2.7	What could these qualifications lead to?	11
	2.7.1 Progression to university	12
	2.7.2 Employment	12
2.8	How Pearson BTEC Higher Nationals in Computing provide both transferable employability skills and academic study skills	13
3	Planning your programme	15
3.1	Delivering the Pearson BTEC Higher Nationals in Computing	15
3.2	Entry requirements and admissions	15
	3.2.1 English language requirements	16
	3.2.2 Centre approval	17
	3.2.3 Level of sector knowledge required	17
	3.2.4 Resources required	17
	3.2.5 HN Global support	17
	3.2.6 Modes of delivery	17
	3.2.7 Recommendations for employer engagement	18
	3.2.8 Support from Pearson	18

3.2.9	Student employability	19
3.3	Access to study	19
3.4	Student registration and entry	19
3.5	Access to assessments	20
3.6	Administrative arrangements for internal assessment	20
3.6.1	Records	20
3.6.2	Reasonable adjustments to assessment	21
3.6.3	Special consideration	21
3.6.4	Appeals against assessment	21
3.7	Dealing with malpractice in assessment	22
3.7.1	Internally assessed units	22
3.7.2	Student malpractice	23
3.7.3	Tutor/centre malpractice	23
3.7.4	Sanctions and appeals	24
4	Programme structure	25
4.1	Units, credits and Total Qualification Time (TQT)	25
4.2	Programme structures	27
4.2.1	Pearson BTEC Level 4 Higher National Certificate in Computing	27
4.2.2	Pearson BTEC Level 5 Higher National Diploma in Computing	32
4.2.3	Units of combination	33
4.2.4	Occupational Standards Alignment	34
4.2.4	Meeting local needs (MLN)	58
4.2.5	Pearson BTEC Higher National Commissioned Development	59
4.3	Pearson-Set Assignments	60
4.4	The Unit Descriptor	61
4.5	Professional Body Recognition	64
4.6	Alignment to Occupational Standards (IfATE)	64
4.7	Vendor Accreditation	65
5	Teaching and learning	69
5.1	Delivering quality and depth	69
5.2	Engaging with employers	71
5.3	Engaging with students	71
5.4	Planning and structuring a programme	72
5.4.1	Sequencing units	73
5.4.2	Condensed, expanded or mixed delivery	73

5.4.3	Drawing on a wide range of delivery techniques	75
5.4.4	Assessment considerations	77
5.4.5	Formative assessment	78
5.4.6	Summative assessment	78
5.4.7	Assessment feedback	78
5.4.8	Designing valid and reliable assessments	79
6	Assessment	81
6.0.1	Example Assessment Briefs	82
6.1	Principles of internal assessment	82
6.1.1	Assessment through assignments	82
6.1.2	Assessment decisions through applying unit-based criteria	83
6.1.3	The assessment team	83
6.1.4	Effective organisation	84
6.1.5	Student preparation	84
6.2	Setting effective assessments	85
6.2.1	Setting the number and structure of assessments	85
6.2.2	Providing an assignment brief	86
6.2.3	Forms of evidence	86
6.3	Making valid assessment decisions	87
6.3.1	Authenticity of student work	87
6.3.2	Making assessment decisions using criteria	88
6.3.3	Dealing with late completion of assignments	88
6.3.4	Issuing assessment decisions and feedback	89
6.3.5	Resubmission opportunity	89
6.3.6	Repeat units	89
6.3.7	Assessment Boards	90
6.4	Planning and record keeping	90
6.5	Calculation of the final qualification grade	91
6.5.1	Conditions for the award	91
6.5.2	Compensation provisions	91
6.5.3	Calculation of the overall qualification grade	92
6.5.4	Modelled student outcomes	93
7	Quality assurance	94
7.1	The approval process	94
7.2	Monitoring of internal centre systems	95
7.3	Independent assessment review	95

7.4	Annual Programme Monitoring Report (APMR)	95
7.5	Annual student survey	96
7.6	Centre and qualification approval	96
7.7	Continuing quality assurance and standards verification	96
8	Recognition of Prior Learning and attainment	98
9	Equality and diversity	99
10	Pearson BTEC Higher Nationals Computing Units	101
11	Appendices	103
	Appendix 1: Professional Body Memberships	104
	Appendix 2: Vendor Accredited Certifications	106
	Appendix 3: SFIA Skill Levels	108
	Appendix 4: Mapping of Pearson BTEC HND in Computing against FHEQ Level 5	160
	Appendix 5: Glossary of terms used for internally assessed units	165
	Appendix 6: Assessment methods and techniques for Pearson BTEC Higher Nationals	169
	Appendix 7: Pearson BTEC HNC/HND Computing Programme Outcomes for Students	174
	Appendix 8: Transferable skills mapping	177
	Level 5 Higher National Diploma in Computing: mapping of transferable employability and academic study skills	177
	Appendix 9: Recognition of Prior Learning	180
	HNCs in Computing: Unit Mapping Overview	180
	HNCs in Computing: Unit Mapping in Depth	182

1 Introduction

BTEC is one of the world's most successful and best-loved applied learning brands, engaging students in practical, interpersonal and thinking skills for more than thirty years.

BTECs are work-related qualifications for students taking their first steps into employment, or for those already in employment and seeking career development opportunities. BTECs provide progression into the workplace either directly or via study at university and are also designed to meet employer's needs. Therefore, Pearson BTEC Higher National qualifications are widely recognised by industry and higher education as the principal vocational qualification at Levels 4 and 5.

When redeveloping the Pearson BTEC Higher National qualifications in Computing, we collaborated with a wide range of students, employers, higher education providers, colleges and subject experts to ensure that the new qualifications meet their needs and expectations. We also worked closely with the relevant professional bodies, to ensure alignment with recognised professional standards.

There is now a greater emphasis on employer engagement and work readiness. The new Pearson BTEC Higher National qualifications in Computing are designed to reflect this increasing need for high quality professional and technical education pathways at Levels 4 and 5, thereby providing students with a clear line of sight to employment and to progression to a degree at Level 6.

1.1 The Student Voice

Students are at the heart of what we do. That is why, from the outset, we consulted with students in the development of these qualifications. We involved them in writing groups, sought their feedback, and added their voices and views to those of other stakeholders.

The result, we believe, are qualifications that will meet the needs and expectations of students worldwide.

1.2 Why choose Pearson BTEC Higher Nationals?

Pearson BTEC Higher Nationals are designed to help students secure the knowledge skills and behaviours needed to succeed in the workplace. They represent the latest in professional standards and provide opportunities for students to develop behaviours for work, for example by undertaking a group project, or responding to a client brief. A student may even achieve exemption from professional or vendor qualifications, or student membership of selected professional bodies, to help them on their journey to professional competence.

At the same time the BTEC Higher Nationals are intended to keep doors open for future study should a student wish to progress further in their education after their level 5 study. They do this by allowing space for the development of higher education study skills, such as the ability to research. Clear alignment of level of demand with the Framework for Higher Education qualification descriptors at level 4 and 5 means that students wishing to progress to level 6 study should feel better prepared. The Pearson BTEC Higher Nationals address these various requirements by providing:

- A range of core, optional and specialist units, each with a clear purpose, so there is something to suit each student's choice of programme and future progression plans.
- Fully revised content that is closely aligned with the needs of employers, professional bodies, vendors and higher education for a skilled future workforce.
- Learning Outcomes mapped against Professional Body standards and vendor accreditation requirements, where appropriate.
- Assessments and projects chosen to help students progress to the next stage (this means some are set by the centre to meet local needs, while others are set by Pearson).
- An approach to demand at level 4 and 5 which is aligned with the Framework for Higher Education Qualifications (FHEQ).
- Support for student and tutors including Schemes of Work and Example Assessment Briefs.

1.3 HN Global

Pearson BTEC Higher Nationals are supported by a specially designed range of digital resources, to ensure that tutors and students have the best possible experience during their course. These are available from the HN Global website <http://www.ighernationals.com/>.

With HN Global, tutors can access programme specifications which contain useful information on programme planning and quality assurance processes. Tutors can also view schemes of work and example assessment briefs, helping them create meaningful courses and assessments. HN Global also allows tutors to create and annotate reading lists for their students and also keep up-to-date on the latest news regarding HN programmes.

1.4 Qualification titles

Pearson BTEC Level 4 Higher National Certificate in Computing

- Pearson BTEC Level 5 Higher National Certificate in Computing (General)
- Pearson BTEC Level 5 Higher National Certificate in Computing (Data Analytics)
- Pearson BTEC Level 5 Higher National Certificate in Computing (Network Engineering)
- Pearson BTEC Level 5 Higher National Certificate in Computing (Security)

Pearson BTEC Level 5 Higher National Diploma in Computing

Specialist pathways are included within brackets in the qualification title:

- Pearson BTEC Level 5 Higher National Diploma in Computing (General)
- Pearson BTEC Level 5 Higher National Diploma in Computing (Software Engineering)
- Pearson BTEC Level 5 Higher National Diploma in Computing (Applications Development)
- Pearson BTEC Level 5 Higher National Diploma in Computing (Data Analytics)
- Pearson BTEC Level 5 Higher National Diploma in Computing (Network Engineering)
- Pearson BTEC Level 5 Higher National Diploma in Computing (Security)

1.5 Qualification codes

Ofqual Regulated Qualifications Framework (RQF) Qualification numbers:

Pearson BTEC Level 4 Higher National Certificate in Computing: **603/0472/8**

Pearson BTEC Level 5 Higher National Diploma in Computing: **603/0471/6**

1.6 Awarding institution

Pearson Education Ltd.

1.7 Key features

Pearson BTEC Higher National qualifications in Computing offer:

- A stimulating and challenging programme of study that will be both engaging and memorable for students.
- The essential subject knowledge that students need to progress successfully into further study or the world of work.

- A simplified structure: students undertake a substantial core of learning in the BTEC Higher National Certificate and can build on this in the BTEC Higher National Diploma, with specialist and optional units linked to their area of study.
- Six specialist pathways in the BTEC Level 5 Higher National Diploma, so there is something to suit each student's preference of study and future progression plans.
- Refreshed content that is closely aligned with Professional Body, vendor, employer and higher education needs.
- Assessments that consider cognitive skills (what students know) along with affective and applied skills (how they behave and what they can do, respectively)
- Unit-specific grading and Pearson-set assignments.
- A varied approach to assessment that supports progression to Level 6 and also allows centres to offer assessment relevant to the local economy, thereby accommodating and enhancing different learning styles.
- Quality assurance measures – as outlined in sections 6 and 7 of this Programme Specification – to ensure that all stakeholders (e.g. professional bodies, vendors, universities, businesses, colleges and students) can feel confident in the integrity and value of the qualifications.
- A qualification designed to meet the needs and expectations of students aspiring to work in an international business environment.

Qualification frameworks

Pearson BTEC Higher National qualifications are designated higher education qualifications in the UK. They are aligned to the Framework for Higher Education Qualifications (FHEQ) in England, Wales and Northern Ireland, and Quality Assurance Agency (QAA) Subject Benchmark Statements. These qualifications are part of the UK Regulated Qualifications Framework (RQF).

1.8 Collaborative development

Students completing their Pearson BTEC Higher Nationals in Computing will be aiming to go on to employment or progress to a final year at university. Therefore, it was essential that we developed these qualifications in close collaboration with experts from professional bodies, vendors, businesses and universities, and with the providers who will be delivering the qualifications.

We are very grateful to the university and further education tutors, employers, vendors, Professional Body representatives and other individuals who have generously shared their time and expertise to help us develop these new qualifications.

AWS

Beam Connectivity

Bedford College

British Computing Society (BCS)

CISCO

CompTIA

Fujitsu

Imago Solutions

Institution of Engineering and Technology (IET)

ISC²

Lockheed Martin

National College for Digital Skills

The Tech Partnership

University of Kent

University of Hull

Uxbridge College

QA Apprenticeships

These qualifications have also been approved by the following professional bodies as suitable qualifications for students wanting to gain membership. The professional bodies include:

- The British Computing Society
- The Institution of Engineering and Technology.

2 Programme purpose and objectives

2.1 Purpose of the Pearson BTEC Higher Nationals in Computing

The purpose of Pearson BTEC Higher Nationals in Computing is to develop students as professional, self-reflecting individuals able to meet the demands of employers in the computing sector and adapt to a constantly changing world. The qualifications aim to widen access to higher education and enhance the career prospects of those who undertake them.

2.2 Objectives of the Pearson BTEC Higher Nationals in Computing

The objectives of the Pearson BTEC Higher Nationals in Computing are as follows:

- To equip students with computing skills, knowledge and the understanding necessary to achieve high performance in the global computing environment.
- To provide education and training for a range of careers in computing, including network engineering, software engineering, Data Analytics, security, intelligent systems, and applications development.
- To provide insight and understanding into international computing operations and the opportunities and challenges presented by a globalised market place.
- To equip students with knowledge and understanding of culturally diverse organisations, cross-cultural issues, diversity and values.
- To provide opportunities for students to enter or progress in employment in computing, or progress to higher education qualifications such as an Honours degree in computing or a related area.
- To provide opportunities for students to develop the skills, techniques and personal attributes essential for successful working lives.
- To provide opportunities for those students with a global outlook to aspire to international career pathways.
- To provide opportunities for students to achieve a nationally recognised professional qualification.
- To provide opportunities for students to achieve vendor accredited certifications.
- To offer students the chance of career progression in their chosen field.
- To allow flexibility of study and to meet local or specialist needs.
- To offer a balance between employability skills and the knowledge essential for students with entrepreneurial, employment or academic aspirations.

We meet these objectives by:

- Providing a thorough grounding in computing principles at Level 4 that leads the student to a range of specialist progression pathways at Level 5 relating to individual professions within the computing sector.
- Enabling progression to a university degree by supporting the development of appropriate academic study skills.
- Enabling progression to further professional qualifications in specific computing areas by mapping to units in a range of vendor accredited certificates.

Who is this qualification for?

The Pearson BTEC Higher National qualifications in Computing are aimed at students wanting to continue their education through applied learning. Pearson BTEC Higher Nationals provide a wide-ranging study of the computing sector and are designed for students who wish to pursue or advance their career in computing. In addition to the knowledge, understanding and skills that underpin the study of the computing sector, Pearson BTEC Higher Nationals in computing give students experience of the breadth and depth of the sector that will prepare them for further study or training.

2.3 Aims of the Pearson BTEC Level 4 Higher National Certificate in Computing

The Pearson BTEC Level 4 Higher National Certificate in Computing offers students a broad introduction to the subject area via a mandatory core of learning, while allowing for the acquisition of skills and experience through the selection of optional units across a range of occupational sectors at Level 4. This effectively builds underpinning core skills while preparing the student for subject specialisation at Level 5. Students will gain a wide range of sector knowledge tied to practical skills gained in research, self-study, directed study and workplace scenarios.

At Level 4 students develop a broad knowledge and awareness of key aspects of the computing sector through six core units, which include one unit assessed by a Pearson-set assignment. The units are:

- Programming
- Networking
- Professional Practice
- Database Design & Development
- Security
- Planning a Computing Project (Pearson-set unit).

The centre can also choose two further optional units at Level 4 from the following:

- Strategic Information Systems
- Management in the Digital Economy
- Website Design & Development
- Maths for Computing
- Fundamentals of Artificial Intelligence and Intelligent Systems

Graduates successfully completing the Pearson BTEC Higher National Certificate in Computing will be able to demonstrate a sound knowledge of the basic concepts of computing. They will be able to communicate accurately and appropriately, and they will have the qualities needed for employment that requires some degree of personal responsibility. They will have developed a range of transferable skills to ensure effective team working, independent initiatives, organisational competence and problem-solving strategies. They will be adaptable and flexible in their approach to computing, show resilience under pressure, and meet challenging targets within a given resource.

2.4 Aims of the Pearson BTEC Level 5 Higher National Diploma in Computing

The Pearson BTEC Level 5 Higher National Diploma in Computing offers students five specialist pathways designed to support progression into relevant occupational areas or on to degree-level study. These pathways are linked to Professional Body standards and vendor accredited certification (where appropriate) and can provide professional status and progression to direct employment.

The Pearson BTEC Higher National Diploma offers the following specialist pathways for students who wish to concentrate on a particular aspect of computing:

- Software Engineering
- Applications Development
- Data Analytics
- Network Engineering
- Security.

There is also a non-specialist 'General' pathway, which allows students to complete a Pearson BTEC Higher National Diploma without committing to a particular professional specialism. This offers additional flexibility to providers and students.

Holders of the Pearson BTEC Higher National Diploma will have developed a sound understanding of the principles in their field of study and will have learned to apply those principles more widely. They will have learned to evaluate the appropriateness of different approaches to solving problems. They will be able to perform effectively in their chosen field and will have the qualities necessary for employment in situations requiring the exercise of personal responsibility and decision-making.

2.5 Use of Maths and English within the curriculum

Those working within the computing sector cannot just rely on their technical skills and must ensure **all** skills are relevant to increase employment opportunities. They will be required to communicate appropriately with stakeholders throughout their career and the ability to use maths and English in a professional context is an essential employability skill that must be developed at all levels of study.

Development of essential maths and English skills are embedded throughout these qualifications in accordance with industry requirements and below are some examples of how these skills are developed in the BTEC Higher Nationals Curriculum:

- Written reports
- Formal presentations
- Informal conversations
- Use of professional, sector-specific language
- Using binary data
- Understanding algorithms
- Calculating costs

Some aspects of computing require higher level maths skills than others, but throughout your studies you will be using some level of maths within the curriculum. It is vital that students taking a BTEC Higher National in Computing are aware that these skills will be required throughout their studies, and as part of learning activities and assessments to ensure their skills are in line with current industry standards.

2.6 The Skills Framework for the Information Age (SFIA)

The Skills Framework for the Information Age (SFIA) is the global skills and competency framework that describes IT roles and the skills needed for them. It is supported by companies, government and academic institutions worldwide. SFIA describes standard levels of responsibility and accountability used in the framework and are divided according to generic levels of responsibility and skills.

The SFIA Level 3 responsibilities would correlate with those expected from an employer of a HNC graduate.

SFIA levels of responsibility: Level 3

- **Autonomy**
 - Works under general direction. Uses discretion in identifying and responding to complex issues and assignments. Usually receives specific instructions and has work reviewed at frequent milestones. Determines when issues should be escalated to a higher level.
- **Influence**
 - Interacts with and influences colleagues. Has working level contact with customers, suppliers and partners. May supervise others or make decisions which impact the work assigned to individuals or phases of projects.
- **Complexity**
 - Performs a range of work, sometimes complex and non-routine, in a variety of environments.
- **Business skills**
 - Demonstrates an analytical and systematic approach to issue resolution. Takes the initiative in identifying and negotiating appropriate personal development opportunities. Demonstrates effective communication skills. Contributes fully to the work of teams. Plans, schedules and monitors own work (and that of others where applicable) competently within limited deadlines and according to relevant legislation, standards and procedures. Appreciates the wider business context, and how own role relates to other roles and to the business of the employer or client.

The SFIA Level 4 responsibilities would correlate with those expected from an employer of a HND graduate.

SFIA levels of responsibility: Level 4

- **Autonomy**
 - Works under general direction within a clear framework of accountability. Exercises substantial personal responsibility and autonomy. Plans own work to meet given objectives and processes.
- **Influence**
 - Influences customers, suppliers and partners at account level. May have some responsibility for the work of others and for the allocation of resources. Participates in external activities related to own specialism. Makes decisions which influence the success of projects and team objectives.
- **Complexity**
 - Work includes a broad range of complex technical or professional activities, in a variety of contexts. Investigates, defines and resolves complex issues.

- Business skills
 - Selects appropriately from applicable standards, methods, tools and applications. Communicates fluently, orally and in writing, and can present complex information to both technical and non-technical audiences. Facilitates collaboration between stakeholders who share common objectives. Plans, schedules and monitors work to meet time and quality targets. Rapidly absorbs new information and applies it effectively. Maintains an awareness of developing technologies and their application and takes some responsibility for driving own development.

For full details of the skills covered in each category for SFIA Levels 3 and 4, see *Appendix 3*.

The SFIA framework was used throughout the design and content creation of Pearson BTEC Higher Nationals in Computing.

The National Occupational Standards for IT professionals are industry standards for skills, developed for the Trailblazer Apprenticeships which have been developed in line with the SFIA framework.

CompTIA and BCS have mapped their membership schemes to the SFIA framework.

By using the SFIA framework the Pearson BTEC Higher Nationals in Computing will be aligned with both the Trailblazer Apprenticeships in Digital Industries and Professional Body memberships.

2.7 What could these qualifications lead to?

The Pearson BTEC Higher National Certificate provides a solid grounding in computing at Level 4, vendor-accredited certification and Professional Body membership, all of which students can build on should they decide to continue their studies beyond the Certificate stage. The Pearson BTEC Higher National Diploma allows students to specialise by committing to occupationally specific career paths and progression routes to degree-level study.

On successful completion of the Pearson BTEC Higher National Diploma at Level 5, students can develop their careers in the computing sector through:

- Entering employment
- Continuing existing employment and move to next apprenticeship level
- Linking with the appropriate vendor accredited certificates
- Committing to Continuing Professional Development (CPD)
- Progressing to university.

2.7.1 Progression to university

The Level 5 Higher National Diploma is recognised by higher education providers as meeting admission requirements to many relevant computing-related courses.

University recognition and articulations

We work with a range of higher education institutions around the world that recognise and accept BTEC Higher Nationals as a qualification for entry onto an undergraduate degree. Many universities allow advanced entry onto the second or third year of a degree, and agreements can include credit transfer, articulation and case-by-case admission. Students should be aware that university admission criteria are always subject to change and remain at the discretion of the institution. Students should take time to understand the course entry requirements for subject, year and grade before applying.

For more information on entry requirements, including 2+1 articulations, please visit: <https://www.highernationals.com/degree-finder>.

2.7.2 Employment

The skills offered as part of the Pearson BTEC Higher National Diploma can provide graduates with the opportunity to work in many different areas of the computing sector. Below are some examples of job roles each qualification could lead to:

Pathway	Job Roles
General / All Pathways	Systems Analyst Data Designer Systems Tester Database Administrator IT Project Manager IT Support Technician Web Designer
Software Engineering	Software Developer Systems Designer Business Analyst Games Developer Web Developer
Applications Development	HCI Designer Games Developer Web Developer

Data Analytics	Data Analyst Business Analyst Marketing Analyst Data Engineer Fraud Analyst Operation Research Scientist
Network Engineering	Network Engineer Systems Architect Computer Service and Repair Technician Network Manager
Security	Forensic Computer Analysts IT Security Coordinator Ethical Hacker Fraud Analyst

These job roles are based on descriptions from The Institute of Apprenticeships and Technical Employment (IfATE) Occupational Standards (OS) and The National Occupational Standards for IT professionals – industry standards for skills, developed in collaboration with employers, professional bodies and others which make it easier for employers to describe job roles, externally and internally. The development of IT Professional Standards was undertaken by The Tech Partnership.

2.8 How Pearson BTEC Higher Nationals in Computing provide both transferable employability skills and academic study skills

Students need both relevant qualifications and employability skills to enhance their career prospects and contribute to their personal development. Pearson BTEC Higher National Computing qualifications embed the development of key skills throughout the programme; attributes and strengths required by 21st century employers.

Where employability skills are referred to in this specification, this generally refers to skills in three main categories:

- **Cognitive and problem-solving skills:** critical thinking, approaching non-routine problems by applying expert and creative solutions, use of systems and digital technology, generating and communicating ideas creatively.
- **Intra-personal skills:** self-management, adaptability and resilience, self-monitoring and self-development, self-analysis and reflection, planning and prioritising.
- **Interpersonal skills:** effective communication and articulation of information, working collaboratively, negotiating and influencing, self-presentation.

Pearson Example Assessment Briefs make recommendations for a range of real or simulated assessment activities, for example, group work where appropriate, to encourage development of collaborative and interpersonal skills or a solution-focused case study to provide the opportunity to develop cognitive skills. There are specific requirements for the assessment of these skills, as relevant, within the assessment grids for each unit. Example Assessment Briefs are for guidance and support only and must be customised and amended according to localised needs and requirements. All assignments must still be verified as per the internal verification process.

Students can also benefit from opportunities for deeper learning, where they are able to make connections between units and select areas of interest for detailed study. In this way Pearson BTEC Higher Nationals provide a vocational context in which students can develop the knowledge and academic study skills required for progression to university degree courses, including:

- Active research skills
- Effective writing skills
- Analytical skills
- Critical thinking
- Creative problem-solving
- Decision-making
- Team building
- Exam preparation skills
- Digital literacy
- Competence in assessment methods used in higher education.

To support you in developing these skills in your students, we have developed a map of higher education relevant transferable and academic study skills, available in appendices.

3 Planning your programme

3.1 Delivering the Pearson BTEC Higher Nationals in Computing

You play a central role in helping your students to choose the right Pearson BTEC Higher National qualification.

You should assess your students very carefully to ensure that they take the right qualification and the right pathways or optional units, to allow them to progress to the next stage. You should check the qualification structures and unit combinations carefully when advising students.

You will need to ensure that your students have access to a full range of information, advice and guidance in order to support them in making the necessary qualification and unit choices. When students are recruited, you need to give them accurate information on the title and focus of the qualification for which they are studying.

While there are six named pathways within the Pearson BTEC Higher National Diploma, centres can accommodate other routes through the qualification using the optional units within the pathways.

For example:

- A centre could deliver the Pearson BTEC Level 5 Higher National Diploma in Computing (Applications Development) and choose between 'Unit 41: Games Engine & Scripting', 'Unit 42: Game Design Theory' and 'Unit 43: Games Development' as the two optional units to make up this qualification which would give the student a games computing experience.
- A centre could deliver the Pearson BTEC Level 5 Higher National Diploma in Computing and choose 'Unit 51: E-Commerce & Strategy' as one of the five optional units to make up this qualification which would give the student a business computing experience.

3.2 Entry requirements and admissions

Although Pearson do not specify formal entry requirements, as a centre it is your responsibility to ensure that the students you recruit have a reasonable expectation of success on the programme.

For students who have recently been in education, the entry profile is likely to include one of the following:

- A BTEC Level 3 qualification in Computing
- A GCE Advanced Level profile that demonstrates strong performance in a relevant subject or adequate performance in more than one GCE subject. This profile is likely to be supported by GCSE grades at A* to C (or equivalent) and/or 9 to 4 (or equivalent)
- Other related Level 3 qualifications
- An Access to Higher Education Diploma awarded by an approved further education institution
- Related work experience
- An international equivalent of the above.

Centres may wish consider applicants' prior learning when considering their acceptance on a Pearson BTEC Higher Nationals, through Recognition of Prior Learning. (For further information please refer to **Section 8** of this document.)

3.2.1 English language requirements

Pearson's mission is to help people make more of their lives through learning. In order for students to be successful on Pearson BTEC Higher National qualifications which are **both** taught and assessed in English, it is critical that they have an appropriate level of English language skills.

The following clarifies the requirements for all centres when recruiting applicants on to new Pearson BTEC Higher National qualifications.

All centres delivering the new Pearson BTEC Higher National qualifications must ensure that all students who are non-native English speakers and who have not undertaken their final two years of schooling in English, can demonstrate capability in English at a standard equivalent to the levels identified below, before being recruited to the programme **where the programme is both taught and assessed in English:**

- Common European Framework of Reference (CEFR) level B2
- PTE **51**
- IELTS **5.5**; Reading and Writing must be at **5.5**
- or equivalent.

It is up to the centre to decide what proof will be necessary to evidence individual student proficiency.

The following clarifies the requirements for all centres when recruiting applicants on to new Pearson BTEC Higher National qualifications which are taught in a language other than English, but are assessed in English.

All centres delivering the new Pearson BTEC Higher National qualifications **wholly or partially** in a language other than English, but who are assessed in English, must ensure that all students can demonstrate capability in English at a standard equivalent to the levels identified below, on completion of the programme:

- Common European Framework of Reference (CEFR) level B2
- PTE **51**
- IELTS **5.5**; Reading and Writing must be at **5.5**
- or equivalent.

It is up to the centre to decide what proof will be necessary to evidence individual student proficiency.

3.2.2 Centre approval

To ensure that centres are ready to assess students and that we can provide the support that is needed all centres must be approved before they can offer these qualifications. For more information about becoming a centre and seeking approval to run our qualifications please visit the support section on our website (<http://qualifications.pearson.com/>).

3.2.3 Level of sector knowledge required

We do not set any requirements for tutors, but we do recommend that centres assess the overall skills and knowledge of the teaching team, which should be relevant, up to date and at the appropriate level.

3.2.4 Resources required

As part of your centre approval, you will need to show that the necessary material resources and work spaces are available to deliver Pearson BTEC Higher Nationals. For some units, specific resources are required, this is clearly indicated in the unit descriptors.

3.2.5 HN Global support

HN Global is an online resource that supports centre planning and delivery of Pearson BTEC Higher Nationals by providing appropriate teaching and learning resources. For further information see sections 5 and 6 of this Programme Specification.

3.2.6 Modes of delivery

Subject to approval by Pearson, centres are free to deliver Pearson BTEC Higher Nationals using modes of delivery that meet the needs of their students. We recommend making use of a wide variety of modes, including:

- Full-time
- Part-time
- Blended learning.

3.2.7 Recommendations for employer engagement

Pearson BTEC Higher Nationals are vocational qualifications and as an approved centre you are encouraged to work with employers on the design, delivery and assessment of the course. This will ensure that students enjoy a programme of study that is engaging and relevant, and which equips them for progression. There are suggestions in section 5.2 about how employers could become involved in delivery and/or assessment, but these are not intended to be exhaustive and there will be other possibilities at a local level.

3.2.8 Support from Pearson

We provide a range of support materials, including Schemes of Work and suggested assignments, with supporting templates. You will be allocated an External Examiner early in the planning stage, to support you with planning your assessments, and there will be training events and support from our Subject Leads.

3.2.9 Student employability

All Pearson BTEC Higher Nationals have been designed and developed with consideration of National Occupational Standards, where relevant, and have been mapped to relevant Professional Body standards and vendor accreditation requirements (see *Appendices 1 & 2*).

Employability skills such as team working and project management as well as practical hands-on skills have been built into the design of the learning aims and content. This gives you the opportunity to use relevant contexts, scenarios and materials to enable students to develop a portfolio of evidence demonstrating the breadth of their skills and knowledge in a way that equips them for employment.

3.3 Access to study

This section focuses on the administrative requirements for delivering a Pearson BTEC Higher National qualification. It will be of value to Quality Nominees, Programme Leaders and Examinations Officers.

Our policy regarding access to our qualifications is that:

- They should be available to everyone who is capable of reaching the required standards.
- They should be free from any barriers that restrict access and progression.

There should be equal opportunities for all those wishing to access the qualifications. We refer Centres to our Pearson Equality and Diversity Policy, which can be found in the support section of our website (<http://qualifications.pearson.com/>).

Centres are required to recruit students to Pearson BTEC Higher National programmes with integrity. They will need to make sure that applicants have relevant information and advice about the qualification, to make sure it meets their needs. Centres should review the applicant's prior qualifications and/or experience to consider whether this profile shows that they have the potential to achieve the qualification. For students with disabilities and specific needs, this review will need to take account of the support available to the student during the teaching and assessment of the qualification. For further guidance and advice please refer to section 9 on reasonable adjustments.

3.4 Student registration and entry

Within 30 days (home students) and 60 days (international students) of enrolment all students should be registered for the qualification, and appropriate arrangements made for internal and external verification. For information on making registrations for the qualification, you will need to refer to the information manual available in the support section of our website (<http://qualifications.pearson.com/>).

Students can be formally assessed only for a qualification on which they are registered. If students' intended qualifications change (for example, if a student decides to choose a different specialist pathway), then the centre must transfer the student to the chosen pathway appropriately. Please note that student work cannot be sampled if the student is not registered or is registered on an incorrect pathway.

3.5 Access to assessments

Assessments need to be administered carefully, to ensure that all students are treated fairly, and that results and certification are issued on time, allowing students to move on to chosen progression opportunities.

Our equality policy requires that all students should have equal opportunity to access our qualifications and assessments, and that our qualifications are awarded in a way that is fair to every student. We are committed to making sure that:

- Students with a protected characteristic (as defined in legislation) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic.
- All students achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Further information on access arrangements can be found on the Joint Council for Qualifications website (<http://www.jcq.org.uk/>).

3.6 Administrative arrangements for internal assessment

3.6.1 Records

You are required to retain records of assessment for each student. Records should include assessments taken, decisions reached and any adjustments or appeals. Further information on quality and assessment can be found in our UK and international guides available in the support section on our website (<http://qualifications.pearson.com/>). We may ask to audit your records, so they must be retained as specified. All student work must be retained for **a minimum of 12 weeks** after certification has taken place.

3.6.2 Reasonable adjustments to assessment

A reasonable adjustment is one that is made before a student takes an assessment, to ensure that he or she has fair access to demonstrate the requirements of the assessments.

You are able to make adjustments to internal assessments to take account of the needs of individual students. In most cases this can be achieved through a defined time extension or by adjusting the format of evidence. We can advise you if you are uncertain as to whether an adjustment is fair and reasonable. You need to plan for time to make adjustments, if necessary.

Further details on how to make adjustments for students with protected characteristics are available on the support section of our website (<http://qualifications.pearson.com/>).

3.6.3 Special consideration

Special consideration is given after an assessment has taken place for students who have been affected by adverse circumstances, such as illness, and require an adjustment of grade to reflect normal level of attainment. You must operate special consideration in line with Pearson policy (see previous paragraph). You can provide special consideration related to the period of time given for evidence to be provided, or for the format of the assessment (if it is equally valid). You may not substitute alternative forms of evidence to that required in a unit, or omit the application of any assessment criteria to judge attainment. Pearson can consider applications for special consideration in line with the policy, which can be found in the document linked above.

Please note that your centre must have a policy for dealing with mitigating circumstances if students are affected by adverse circumstances, such as illness, which result in non-submission or late submission of assessment.

3.6.4 Appeals against assessment

Your centre must have a policy for dealing with appeals from students. These appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy could be a consideration of the evidence by a Programme Leader or other member of the programme team. The assessment plan should allow time for potential appeals after assessment decisions have been given to students. If there is an appeal by a student, you must document the appeal and its resolution. Students have a final right of appeal to Pearson, but only if the procedures that you have put in place have been followed. Further details of our policy on enquiries and appeals is available on the support section of our website (<http://qualifications.pearson.com/>).

If your centre is located in England or Wales and the student is still dissatisfied with the final outcome of their appeal s/he can make a further appeal to the Office of the Independent Adjudicator (OIA) by emailing: enquiries@oiahe.org.uk. In Northern Ireland a further appeal may be lodged with the Northern Ireland Public Service Ombudsman (NIPSO) by emailing: nipso@nipso.org.uk.

3.7 Dealing with malpractice in assessment

'Malpractice' means acts that undermine the integrity and validity of assessment, the certification of qualifications and/or may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actual or attempted actions of malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose penalties and/or sanctions on learners, centre staff or centres where malpractice or attempted malpractice has been proven.

Malpractice may occur or be suspected in relation to any unit or type of assessment within a qualification. For further details on malpractice and advice on preventing malpractice by learners, please see Pearson's Centre Guidance: Dealing with Malpractice, available on our website.

The procedures we ask you to adopt vary between units that are internally assessed and those that are externally assessed.

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Learners must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. The Centre Guidance: Dealing with Malpractice document gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe a centre is failing to conduct internal assessment according to our policies. The above document gives further information and examples, and details the penalties and sanctions that may be imposed.

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

3.7.1 Internally assessed units

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Students must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. Full information on dealing with malpractice and plagiarism is available on the support section of our website (<http://qualifications.pearson.com/>). It provides full information on the actions we expect you to take.

Pearson may conduct investigations if it is believed that a centre is failing to conduct internal assessment according to Pearson policies. The above document gives further information, provides examples, and details the penalties and sanctions that may be imposed.

3.7.2 Student malpractice

The head of centre is required to report incidents of suspected learner malpractice that occur during Pearson qualifications. We ask centres to complete *JCQ Form M1* (www.jcq.org.uk/malpractice) and email it with any accompanying documents (signed statements from the learner, invigilator, copies of evidence, etc) to the Investigations Processing team at candidatemalpractice@pearson.com. The responsibility for determining appropriate sanctions or penalties to be imposed on learners lies with Pearson.

Learners must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Learners found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson.

Failure to report malpractice constitutes staff or centre malpractice.

3.7.3 Tutor/centre malpractice

The head of centre is required to inform Pearson's Investigations team of any incident of suspected malpractice (which includes maladministration) by centre staff, before any investigation is undertaken. The head of centre is requested to inform the Investigations team by submitting a *JCQ M2 Form* (downloadable from www.jcq.org.uk/malpractice) with supporting documentation to pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example Pearson staff, anonymous informants), the Investigations team will conduct the investigation directly or may ask the head of centre to assist.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results/certificates while an investigation is in progress. Depending on the outcome of the investigation, results and/or certificates may not be released or they may be withheld.

We reserve the right to withhold certification when undertaking investigations, audits and quality assurance processes. You will be notified within a reasonable period of time if this occurs.

3.7.4 Sanctions and appeals

Where malpractice is proven, we may impose sanctions or penalties, such as:

- mark reduction for affected external assessments
- disqualification from the qualification
- debarment from registration for Pearson qualifications for a period of time.

If we are concerned about your centre's quality procedures we may impose sanctions such as:

- working with centres to create an improvement action plan
- requiring staff members to receive further training
- placing temporary suspensions on certification of learners
- placing temporary suspensions on registration of learners
- debarring staff members or the centre from delivering Pearson qualifications
- suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for centres that are considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from the head of centre (on behalf of learners and/or members or staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in the *JCQ Appeals booklet* (<https://www.jcq.org.uk/exams-office/appeals>).

4 Programme structure

4.1 Units, credits and Total Qualification Time (TQT)

The Pearson BTEC Higher National Certificate (HNC) is a Level 4 qualification made up of 120 credits. It is usually studied full-time over one year, or part-time over two years.

The Pearson BTEC Higher National Diploma (HND) is a Level 4 and Level 5 qualification made up of 240 credits. It is usually studied full-time over two years, or part-time over four years.

Pearson would expect that a BTEC Higher National Diploma student would have achieved at least 90 credits at Level 4 before progressing to Level 5 units. This allows for the students to submit the remaining 30 credits at Level 4 while undertaking their Level 5 study.

Students undertaking a Pearson BTEC Higher National Diploma who fail to successfully complete the full qualification may be awarded a HNC, if their credit achievement permits.

Pearson BTEC Higher Nationals consist of core units, specialist units and optional units:

- Core are mandatory
- Specialist units are designed to provide a specific occupational focus to the qualification and are aligned to vendor accredited certification
- Required combinations of optional units are clearly set out in the tables below.

All units are usually 15 credits in value, or a multiple thereof. These units have been designed from a learning time perspective, and are expressed in terms of **Unit Learning Hours (ULH)**.

- **Unit Learning Hours (ULH)** represent the total hours that a student needs to achieve the required learning outcomes, for a given *Unit*.
- **Total Qualification Time (TQT)** is an estimate of the total amount of time that could reasonably be expected to be required for a student to achieve and demonstrate the achievement of the level of attainment necessary for the award of a *qualification*.

ULH contribute to the overall Total Qualification Time (TQT). TQT includes undertaking each of the activities of Guided Learning, Directed Learning and Invigilated Assessment. Each 15-credit unit approximates to a 150 Unit Learning Hours (ULH); including 60 hours of Guided Learning.

Total Qualification Time (TQT) Higher National Certificate (HNC) = 1,200 hours

Total Qualification Time (TQT) Higher National Diploma (HND) = 2,400 hours

Examples of activities which can contribute to Total Qualification Time include:

- Guided Learning
- Independent and unsupervised research/learning
- Unsupervised compilation of a portfolio of work experience
- Unsupervised e-learning
- Unsupervised e-assessment
- Unsupervised coursework
- Watching a pre-recorded podcast or webinar
- Unsupervised work-based learning.

Guided Learning Hours (GLH) are defined as the time when a tutor is present to give specific guidance towards the learning aim being studied on a programme. This definition includes lectures, tutorials and supervised study in, for example, open learning centres and learning workshops. Guided Learning includes any supervised assessment activity; this includes invigilated examination and observed assessment and observed work-based practice.

Total Guided Learning (GL) Higher National Certificate (HNC) = 480 hours

Total Guided Learning (GL) Higher National Diploma (HND) = 960 hours

Some examples of activities which can contribute to Guided Learning include:

- Classroom-based learning supervised by a tutor
- Work-based learning supervised by a tutor
- Live webinar or telephone tutorial with a tutor in real time
- E-learning supervised by a tutor in real time
- All forms of assessment which take place under the immediate guidance or supervision of a tutor or other appropriate provider of education or training, including where the assessment is competency-based and may be turned into a learning opportunity.

4.2 Programme structures

The programme structures specify:

- The total credit value of the qualification
- The minimum credit to be achieved at the level of the qualification
- The core units
- The specialist units
- The optional units
- The maximum credit value in units that can be centre commissioned.

When combining units for a Pearson BTEC Higher National qualification, it is the centre's responsibility to make sure that the correct unit combinations are followed.

4.2.1 Pearson BTEC Level 4 Higher National Certificate in Computing

- Qualification credit value: a minimum of 120 credits. This is made up of eight units, each with a value of 15 credits.
- **Total Qualification Time (TQT)** Higher National Certificate (HNC) = 1,200
- **Total Guided Learning Hours (GLH)** Higher National Certificate (HNC) = 480
- There is a required mix of core, specialist and optional units totalling 120 credits. All units are at Level 4.
- In some cases a maximum of 30 credits can be imported from another RQF Pearson BTEC Higher National qualification and/or from units designed by the centre and approved by Pearson. Core units may **not** be substituted and are **mandatory**. For more information please refer to Higher National Commissioned Qualifications.
- Please note that some specialist units are available as optional units and some optional units are available as specialist units.

Pearson BTEC Level 4 Higher National Certificate in Computing (General Pathway)		Unit credit	Level
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	7 Software Development Lifecycles	15	4
Plus ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Note: The General pathway is the prerequisite pathway for students who wish to progress to the General, Software Engineering or Application Development pathways at Level 5.

Pearson BTEC Level 4 Higher National Certificate in Computing (Data Analytics Pathway)		Unit credit	Level
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	8 Data Analytics	15	4
Plus ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Note: The Data Analytics pathway is the prerequisite pathway for students who wish to progress to the Data Analytics pathway at Level 5.

Pearson BTEC Level 4 Higher National Certificate in Computing (Network Engineering Pathway)		Unit credit	Level
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	9 Computer Systems Architecture	15	4
Plus ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Note: The Network Engineering pathway is the prerequisite pathway for students who wish to progress to the Network Engineering pathway at Level 5.

Pearson BTEC Level 4 Higher National Certificate in Computing (Security Pathway)		Unit credit	Level
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	10 Cyber Security	15	4
Plus, ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Note: The Security pathway is the prerequisite pathway for students who wish to progress to the Security pathway at Level 5.

4.2.2 Pearson BTEC Level 5 Higher National Diploma in Computing

- Qualification credit value: a minimum of 240 credits of which 120 credits are at Level 5, and 120 credits are at Level 4 and usually attained via the HNC.
- **Total Qualification Time (TQT)** Higher National Diploma (HND) = 2,400 hours.
- **Total Guided Learning Hours (GLH)** Higher National Diploma (HND) = 960 hours.
- There is a required mix of core, specialist and optional units for each pathway.
- The core units required for each Level 5 pathway (in addition to the specialist units) are 'Unit 13: Computing Research Project' which is weighted at 30 credits, and 'Unit 14: Business Intelligence', weighted at 15 credits.
- The requirements of the Higher National Certificate (or equivalent) have to be met. In some cases a maximum of 60 credits can be imported from another
- RQF Pearson BTEC Higher National qualification and/or from units designed by the centre and approved by Pearson. Core units and specialist units may **not** be substituted.
- Please note that some specialist units are available as optional units and some optional units are available as specialist units.

The Level 5 Higher National Diploma consists of the Level 4 Higher National Certificate (above) plus an additional 120 credits at Level 5 delivered via the General Computing pathway or one of the following five specialist pathways:

- Software Engineering
- Applications Development
- Data Analytics
- Network Engineering
- Security

The pathways and unit combinations are as follows; for the list of optional units for all pathways at Level 5, please see following pages.

4.2.3 Units of combination

Students will typically progress within the pathways, as shown in Figure 1 (below). Where a Centre may allow students to change pathways, from Level 4 to Level 5, they must undertake a suitable mapping of recognition of prior learning (RPL) in support of any potential review by an External Examiner.

Level 4	General			Data Analytics	Network Engineer	Security
Level 5	General	Software Engineer	Applications Development	Data Analytics	Network Engineer	Security

Figure 1

Qualification credit value: a minimum of 240 credits, of which 120 credits are at Level 5, and 120 credits are at Level 4 and usually attained via the HNC. There is a required mix of core, specialist and optional units totalling 240 credits.

The core units required for each Level 5 specialist pathway (in addition to the specialist units) are Computing Research Project (Pearson-set), weighted at 30 credits, and Business Process Support which is weighted at 15 credits.

The requirements of the Higher National Certificate (or equivalent) have to be met first before the Higher National Diploma can be achieved. In some cases, a maximum of 60 credits can be imported from another RQF Pearson BTEC Higher National qualification and/or from units designed by the Centre and approved by Pearson. Core units and specialist units may not be substituted.

In order to ensure BTEC HND students have the skills required to achieve on specialist pathways we advise that students intending to study the BTEC Higher National Diploma (Network Engineering), BTEC Higher National Diploma (Software Engineering) or the BTEC Higher National Diploma (Data Analytics) also study 'Unit 11: Maths for Computing' at Level 4.

Students studying on the BTEC Higher National Diploma (Security) are required to study 'Unit 23: Cryptography', before they study 'Unit 25: Information Security Management'.

4.2.4 Occupational Standards Alignment

The level 5 specialist pathways have each been aligned to the digital Occupational Standards (OS) as defined by the Institute for Apprenticeship's and Technical Education (IfATE) (see figure 2 below). The knowledge, skills and behaviours (KSB's) required to meet a specific OS are embedded within both the level 4 and level 5 units of each specific pathway.

The Higher National Certificate and the Higher National Diploma must be fully completed ***in a selected pathway*** to achieve the aligned OS.

Level 4 Pathway	General			Data Analytics	Network Engineer	Security
Level 5 Pathway	General	Software Engineer	Applications Development	Data Analytics	Network Engineer	Security
Occupational Standard	Business Analyst	Software Developer	Software Tester	Data Analytics	Network Engineer	Cyber Security Technologist

Figure 2

Pearson BTEC Level 5 Higher National Diploma in Computing (General Pathway)		Unit credit	Level
Level 4 Units			
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	7 Software Development Lifecycles	15	4
Plus, ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Level 5 Units:			
Core Unit Mandatory	16 Computing Research Project (Pearson-set)	30	5
Core Unit Mandatory	17 Business Process Support	15	5
<p>Plus, FIVE Optional Level 5 units from Optional Unit Bank (see below), or ONE from each specialist pathway. * Please note that centres can choose any of the 5 optional units from the Level 5 Optional Units bank or from the Specialist Level 5 units listed below. It is advised to choose one unit from each optional group to deliver a comprehensive general computing qualification. The Specialist units have been grouped according to sector specialism for ease of recognition.</p>			
Level 5 Optional Units			
Optional Unit	33 Applied Analytical Models	15	5
Optional Unit	34 Analytical Methods	15	5
Optional Unit	35 Systems Analysis & Design	15	5
Optional Unit	36 User Experience & Interface Design	15	5
Optional Unit	37 Architecture	15	5
Optional Unit	38 Analytic Architecture Design	15	5
Optional Unit	39 Network Management	15	5
Optional Unit	40 Client/Server Computing Systems	15	5
Optional Unit	41 Database Management Systems	15	5
Optional Unit	42 Game Design Theory	15	5
Optional Unit	43 Games Development	15	5
Optional Unit	44 Games Engine & Scripting	15	5
Optional Unit	45 Internet of Things	15	5
Optional Unit	46 Robotics	15	5
Optional Unit	47 Emerging Technologies	15	5
Optional Unit	48 Virtual & Augmented Reality Development	15	5
Optional Unit	49 Systems Integration	15	5
Optional Unit	50 Operating Systems	15	5

Optional Unit	51 E-Commerce & Strategy	15	5
Optional Unit	52 Digital Sustainability	15	5
Optional Unit	53 Digital Technologies as a Catalyst for Change	15	5
Optional Unit	54 Prototyping	15	5
Specialist L5 Optional Units			
Group A: Software Engineering			
Optional Unit	18 Discrete Maths	15	5
Optional Unit	19 Data Structures & Algorithms	15	5
Optional Unit	20 Applied Programming and Design Principle	15	5
Group B: Application Development			
Optional Unit	21 Application Programme Interfaces (API)	15	5
Optional Unit	22 Application Development	15	5
Optional Unit	23 Risk Analysis and Systems Testing	15	5
Group C: Data Analytics			
Optional Unit	24 Advanced Programming for Data Analysis	15	5
Optional Unit	25 Machine Learning	15	5
Optional Unit	26 Big Data Analytics and Visualisation	15	5
Group D: Network Engineering			
Optional Unit	27 Transport Network Design	15	5
Optional Unit	28 Cloud Computing	15	5
Optional Unit	29 Network Security	15	5
Group E: Security			
Optional Unit	30 Cryptography	15	5
Optional Unit	31 Forensics	15	5
Optional Unit	32 Information Security Management	15	5

Pearson BTEC Level 5 Higher National Diploma in Computing (Software Engineering Pathway)		Unit credit	Level
Level 4 Units			
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	7 Software Development Lifecycles	15	4
Plus, ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Level 5 Units:			
Core Unit Mandatory	16 Computing Research Project (Pearson-set)	30	5
Core Unit Mandatory	17 Business Process Support	15	5
<i>Specialist Unit Mandatory</i>	18 Discrete Maths	15	5
<i>Specialist Unit Mandatory</i>	19 Data Structures and Algorithms	15	5
<i>Specialist Unit Mandatory</i>	20 Applied Programming and Design Principles	15	5
Plus, TWO Optional Level 5 units from Optional Unit Bank (see below), or one from the Optional Unit Bank and one another specialist pathway.			
Level 5 Optional Units			
Optional Unit	33 Applied Analytical Models	15	5
Optional Unit	34 Analytical Methods	15	5
Optional Unit	35 Systems Analysis & Design	15	5
Optional Unit	36 User Experience & Interface Design	15	5
Optional Unit	37 Architecture	15	5
Optional Unit	38 Analytic Architecture Design	15	5
Optional Unit	39 Network Management	15	5
Optional Unit	40 Client/Server Computing Systems	15	5
Optional Unit	41 Database Management Systems	15	5
Optional Unit	42 Game Design Theory	15	5
Optional Unit	43 Games Development	15	5
Optional Unit	44 Games Engine & Scripting	15	5
Optional Unit	45 Internet of Things	15	5
Optional Unit	46 Robotics	15	5
Optional Unit	47 Emerging Technologies	15	5

Optional Unit	48 Virtual & Augmented Reality Development	15	5
Optional Unit	49 Systems Integration	15	5
Optional Unit	50 Operating Systems	15	5
Optional Unit	51 E-Commerce & Strategy	15	5
Optional Unit	52 Digital Sustainability	15	5
Optional Unit	53 Digital Technologies as a Catalyst for Change	15	5
Optional Unit	54 Prototyping	15	5
Specialist L5 Optional Units			
Group A: Software Engineering			
Optional Unit	18 Discrete Maths	15	5
Optional Unit	19 Data Structures & Algorithms	15	5
Optional Unit	20 Applied Programming and Design Principle	15	5
Group B: Application Development			
Optional Unit	21 Application Programme Interfaces (API)	15	5
Optional Unit	22 Application Development	15	5
Optional Unit	23 Risk Analysis and Systems Testing	15	5
Group C: Data Analytics			
Optional Unit	24 Advanced Programming for Data Analysis	15	5
Optional Unit	25 Machine Learning	15	5
Optional Unit	26 Big Data Analytics and Visualisation	15	5
Group D: Network Engineering			
Optional Unit	27 Transport Network Design	15	5
Optional Unit	28 Cloud Computing	15	5
Optional Unit	29 Network Security	15	5
Group E: Security			
Optional Unit	30 Cryptography	15	5
Optional Unit	31 Forensics	15	5

Optional Unit	32 Information Security Management	15	5
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Pearson BTEC Level 5 Higher National Diploma in Computing (Applications Development Pathway)		Unit credit	Level
Level 4 Units			
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	7 Software Development Lifecycles	15	4
Plus, ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Level 5 Units:			
Core Unit Mandatory	16 Computing Research Project (Pearson-set)	30	5
Core Unit Mandatory	17 Business Process Support	15	5
<i>Specialist Unit Mandatory</i>	21 Application Programme Interfaces (API)	15	5
<i>Specialist Unit Mandatory</i>	22 Application Development	15	5
<i>Specialist Unit Mandatory</i>	23 Risk Analysis and Systems Testing	15	5
Plus, TWO Optional Level 5 units from Optional Unit Bank (see below), or one from the Optional Unit Bank and one another specialist pathway.			
Level 5 Optional Units			
Optional Unit	33 Applied Analytical Models	15	5
Optional Unit	34 Analytical Methods	15	5
Optional Unit	35 Systems Analysis & Design	15	5
Optional Unit	36 User Experience & Interface Design	15	5
Optional Unit	37 Architecture	15	5
Optional Unit	38 Analytic Architecture Design	15	5
Optional Unit	39 Network Management	15	5
Optional Unit	40 Client/Server Computing Systems	15	5
Optional Unit	41 Database Management Systems	15	5
Optional Unit	42 Game Design Theory	15	5
Optional Unit	43 Games Development	15	5
Optional Unit	44 Games Engine & Scripting	15	5
Optional Unit	45 Internet of Things	15	5
Optional Unit	46 Robotics	15	5
Optional Unit	47 Emerging Technologies	15	5

Optional Unit	48 Virtual & Augmented Reality Development	15	5
Optional Unit	49 Systems Integration	15	5
Optional Unit	50 Operating Systems	15	5
Optional Unit	51 E-Commerce & Strategy	15	5
Optional Unit	52 Digital Sustainability	15	5
Optional Unit	53 Digital Technologies as a Catalyst for Change	15	5
Optional Unit	54 Prototyping	15	5
Specialist L5 Optional Units			
Group A: Software Engineering			
Optional Unit	18 Discrete Maths	15	5
Optional Unit	19 Data Structures & Algorithms	15	5
Optional Unit	20 Applied Programming and Design Principle	15	5
Group B: Application Development			
Optional Unit	21 Application Programme Interfaces (API)	15	5
Optional Unit	22 Application Development	15	5
Optional Unit	23 Risk Analysis and Systems Testing	15	5
Group C: Data Analytics			
Optional Unit	24 Advanced Programming for Data Analysis	15	5
Optional Unit	25 Machine Learning	15	5
Optional Unit	26 Big Data Analytics and Visualisation	15	5
Group D: Network Engineering			
Optional Unit	27 Transport Network Design	15	5
Optional Unit	28 Cloud Computing	15	5
Optional Unit	29 Network Security	15	5
Group E: Security			
Optional Unit	30 Cryptography	15	5
Optional Unit	31 Forensics	15	5

Optional Unit	32 Information Security Management	15	5
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Pearson BTEC Level 5 Higher National Diploma in Computing (Applications Development Pathway)		Unit credit	Level
Level 4 Units			
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	8 Data Analytics	15	4
Plus, ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Level 5 Units:			
Core Unit Mandatory	16 Computing Research Project (Pearson-set)	30	5
Core Unit Mandatory	17 Business Process Support	15	5
<i>Specialist Unit Mandatory</i>	24 Advanced Programming for Data Analysis	15	5
<i>Specialist Unit Mandatory</i>	25 Machine Learning	15	5
<i>Specialist Unit Mandatory</i>	23 Big Data Analytics and Visualisation	15	5
Plus, TWO Optional Level 5 units from Optional Unit Bank (see below), or one from the Optional Unit Bank and one another specialist pathway.			
Level 5 Optional Units			
Optional Unit	33 Applied Analytical Models	15	5
Optional Unit	34 Analytical Methods	15	5
Optional Unit	35 Systems Analysis & Design	15	5
Optional Unit	36 User Experience & Interface Design	15	5
Optional Unit	37 Architecture	15	5
Optional Unit	38 Analytic Architecture Design	15	5
Optional Unit	39 Network Management	15	5
Optional Unit	40 Client/Server Computing Systems	15	5
Optional Unit	41 Database Management Systems	15	5
Optional Unit	42 Game Design Theory	15	5
Optional Unit	43 Games Development	15	5
Optional Unit	44 Games Engine & Scripting	15	5
Optional Unit	45 Internet of Things	15	5
Optional Unit	46 Robotics	15	5
Optional Unit	47 Emerging Technologies	15	5

Optional Unit	48 Virtual & Augmented Reality Development	15	5
Optional Unit	49 Systems Integration	15	5
Optional Unit	50 Operating Systems	15	5
Optional Unit	51 E-Commerce & Strategy	15	5
Optional Unit	52 Digital Sustainability	15	5
Optional Unit	53 Digital Technologies as a Catalyst for Change	15	5
Optional Unit	54 Prototyping	15	5
Specialist L5 Optional Units			
Group A: Software Engineering			
Optional Unit	18 Discrete Maths	15	5
Optional Unit	19 Data Structures & Algorithms	15	5
Optional Unit	20 Applied Programming and Design Principle	15	5
Group B: Application Development			
Optional Unit	21 Application Programme Interfaces (API)	15	5
Optional Unit	22 Application Development	15	5
Optional Unit	23 Risk Analysis and Systems Testing	15	5
Group C: Data Analytics			
Optional Unit	24 Advanced Programming for Data Analysis	15	5
Optional Unit	25 Machine Learning	15	5
Optional Unit	26 Big Data Analytics and Visualisation	15	5
Group D: Network Engineering			
Optional Unit	27 Transport Network Design	15	5
Optional Unit	28 Cloud Computing	15	5
Optional Unit	29 Network Security	15	5
Group E: Security			
Optional Unit	30 Cryptography	15	5
Optional Unit	31 Forensics	15	5

Optional Unit	32 Information Security Management	15	5
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Pearson BTEC Level 5 Higher National Diploma in Computing (Network Engineer)		Unit credit	Level
Level 4 Units			
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	9 Computer Systems Architecture	15	4
Plus, ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Level 5 Units:			
Core Unit Mandatory	16 Computing Research Project (Pearson-set)	30	5
Core Unit Mandatory	17 Business Process Support	15	5
<i>Specialist Unit Mandatory</i>	27 Transport Network Design	15	5
<i>Specialist Unit Mandatory</i>	28 Cloud Computing	15	5
<i>Specialist Unit Mandatory</i>	29 Network Security	15	5
Plus, TWO Optional Level 5 units from Optional Unit Bank (see below), or one from the Optional Unit Bank and one another specialist pathway.			
Level 5 Optional Units			
Optional Unit	33 Applied Analytical Models	15	5
Optional Unit	34 Analytical Methods	15	5
Optional Unit	35 Systems Analysis & Design	15	5
Optional Unit	36 User Experience & Interface Design	15	5
Optional Unit	37 Architecture	15	5
Optional Unit	38 Analytic Architecture Design	15	5
Optional Unit	39 Network Management	15	5
Optional Unit	40 Client/Server Computing Systems	15	5
Optional Unit	41 Database Management Systems	15	5
Optional Unit	42 Game Design Theory	15	5
Optional Unit	43 Games Development	15	5
Optional Unit	44 Games Engine & Scripting	15	5
Optional Unit	45 Internet of Things	15	5
Optional Unit	46 Robotics	15	5
Optional Unit	47 Emerging Technologies	15	5

Optional Unit	48 Virtual & Augmented Reality Development	15	5
Optional Unit	49 Systems Integration	15	5
Optional Unit	50 Operating Systems	15	5
Optional Unit	51 E-Commerce & Strategy	15	5
Optional Unit	52 Digital Sustainability	15	5
Optional Unit	53 Digital Technologies as a Catalyst for Change	15	5
Optional Unit	54 Prototyping	15	5
Specialist L5 Optional Units			
Group A: Software Engineering			
Optional Unit	18 Discrete Maths	15	5
Optional Unit	19 Data Structures & Algorithms	15	5
Optional Unit	20 Applied Programming and Design Principle	15	5
Group B: Application Development			
Optional Unit	21 Application Programme Interfaces (API)	15	5
Optional Unit	22 Application Development	15	5
Optional Unit	23 Risk Analysis and Systems Testing	15	5
Group C: Data Analytics			
Optional Unit	24 Advanced Programming for Data Analysis	15	5
Optional Unit	25 Machine Learning	15	5
Optional Unit	26 Big Data Analytics and Visualisation	15	5
Group D: Network Engineering			
Optional Unit	27 Transport Network Design	15	5
Optional Unit	28 Cloud Computing	15	5
Optional Unit	29 Network Security	15	5
Group E: Security			
Optional Unit	30 Cryptography	15	5
Optional Unit	31 Forensics	15	5

Optional Unit	32 Information Security Management	15	5
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Pearson BTEC Level 5 Higher National Diploma in Computing (Security Pathway)		Unit credit	Level
Level 4 Units			
Core Unit Mandatory	1 Programming	15	4
Core Unit Mandatory	2 Networking	15	4
Core Unit Mandatory	3 Professional Practice	15	4
Core Unit Mandatory	4 Database Design & Development	15	4
Core Unit Mandatory	5 Security	15	4
Core Unit Mandatory	6 Managing a Successful Computing Project (Pearson-set)	15	4
<i>Specialist Unit Mandatory</i>	10 Cyber Security	15	4
Plus, ONE optional unit from the L4 Optional Unit Bank (see below)			
Optional Unit	11 Strategic Information Systems	15	4
Optional Unit	12 Management in the Digital Economy	15	4
Optional Unit	13 Website Design and Development	15	4
Optional Unit	14 Maths for Computing	15	4
Optional Unit	15 Fundamentals of Artificial Intelligence and Intelligent Systems	15	4

Level 5 Units:			
Core Unit Mandatory	16 Computing Research Project (Pearson-set)	30	5
Core Unit Mandatory	17 Business Process Support	15	5
<i>Specialist Unit Mandatory</i>	30 Cryptography	15	5
<i>Specialist Unit Mandatory</i>	31 Forensics	15	5
<i>Specialist Unit Mandatory</i>	32 Information Security Management	15	5
Plus, TWO Optional Level 5 units from Optional Unit Bank (see below), or one from the Optional Unit Bank and one another specialist pathway.			
Level 5 Optional Units			
Optional Unit	33 Applied Analytical Models	15	5
Optional Unit	34 Analytical Methods	15	5
Optional Unit	35 Systems Analysis & Design	15	5
Optional Unit	36 User Experience & Interface Design	15	5
Optional Unit	37 Architecture	15	5
Optional Unit	38 Analytic Architecture Design	15	5
Optional Unit	39 Network Management	15	5
Optional Unit	40 Client/Server Computing Systems	15	5
Optional Unit	41 Database Management Systems	15	5
Optional Unit	42 Game Design Theory	15	5
Optional Unit	43 Games Development	15	5
Optional Unit	44 Games Engine & Scripting	15	5
Optional Unit	45 Internet of Things	15	5
Optional Unit	46 Robotics	15	5
Optional Unit	47 Emerging Technologies	15	5

Optional Unit	48 Virtual & Augmented Reality Development	15	5
Optional Unit	49 Systems Integration	15	5
Optional Unit	50 Operating Systems	15	5
Optional Unit	51 E-Commerce & Strategy	15	5
Optional Unit	52 Digital Sustainability	15	5
Optional Unit	53 Digital Technologies as a Catalyst for Change	15	5
Optional Unit	54 Prototyping	15	5
Specialist L5 Optional Units			
Group A: Software Engineering			
Optional Unit	18 Discrete Maths	15	5
Optional Unit	19 Data Structures & Algorithms	15	5
Optional Unit	20 Applied Programming and Design Principle	15	5
Group B: Application Development			
Optional Unit	21 Application Programme Interfaces (API)	15	5
Optional Unit	22 Application Development	15	5
Optional Unit	23 Risk Analysis and Systems Testing	15	5
Group C: Data Analytics			
Optional Unit	24 Advanced Programming for Data Analysis	15	5
Optional Unit	25 Machine Learning	15	5
Optional Unit	26 Big Data Analytics and Visualisation	15	5
Group D: Network Engineering			
Optional Unit	27 Transport Network Design	15	5
Optional Unit	28 Cloud Computing	15	5
Optional Unit	29 Network Security	15	5
Group E: Security			
Optional Unit	30 Cryptography	15	5
Optional Unit	31 Forensics	15	5

Optional Unit	32 Information Security Management	15	5
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4.2.4 Meeting local needs (MLN)

Centres should note that Pearson BTEC Higher National qualifications have been developed in consultation with centres, employers and relevant professional organisations. The units were designed to meet the skill needs of the sector and thereby allow coverage of the full range of employment within the sector. Centres should make maximum use of the choices available to them within the specialist pathways to meet the needs of their students, as well as the local skills and training needs.

Where centres identify a specific need that cannot be addressed using the units in this specification, centres can seek approval to use units from other RQF Pearson BTEC Higher National qualifications, through the MLN process (refer to *Commissioned qualification design and validation service* of our website

<http://qualifications.pearson.com> or get in touch your Pearson regional contact for application details. Centres will need to justify the rationale for importing units from other RQF Pearson BTEC Higher National specifications. **Meeting local need applications must be made in advance of delivery and before 31 January in the year of student registration.**

The flexibility to import standard units from other RQF Pearson BTEC Higher National specifications is **limited to a maximum of 30 credits in a BTEC HNC qualification and a maximum of 60 credits in a BTEC HND qualification (30 credits at Level 4 and 30 credits at Level 5)**. This is an overall maximum of units that can be imported. MLN units cannot be used at the expense of the mandatory units in any qualification nor can the qualification's rules of combination, as detailed in the specification, be compromised. It is the responsibility of the centre requesting the MLN to ensure that approved units are used only in eligible combinations.

For the **Pearson BTEC Level 4 Higher National Certificate in Computing** and **Pearson BTEC Level 5 Higher National Diploma in Computing**, the maximum number of credits that can be imported by pathway are as follows:

Qualification	Pathway	Import at Level 4	Import at Level 5
Pearson BTEC Level 4 Higher National Certificate in Computing	Computing (General)	30	-
Pearson BTEC Level 5 Higher National Diploma in Computing	Computing (General)	30	30
	Software Engineering	30	30
	Application Development	30	30
	Data Analytics	30	30
	Network Engineering	30	30
	Security	30	30

4.2.5 Pearson BTEC Higher National Commissioned Development

Where MLN does not provide enough flexibility in terms of qualification structure, centres can request design and development of units by Pearson to meet their specific needs. This is offered by the following types of developments; full commission or partial commission.

We would be pleased to discuss your ideas for a Pearson BTEC Higher National Commissioned Development. For more information please refer to the *Commissioned qualification design and validation service* on our website <http://qualifications.pearson.com>

Once the centre is ready to proceed with a commissioned development, an application must be made, which provides a clear rationale for the development request. Pearson will review the application and may confirm or deny the request. The commissioned unit(s) will be authored by Pearson, in full consultation within the commissioning centre. Applications must be made one year in advance of the first year of commissioned unit(s) delivery.

4.3 Pearson-Set Assignments

There are Pearson-set assignments, as part of the core units. Each year, Pearson will issue a *Theme* and (for Level 4) a set of related *Topics*. Centres will develop an assignment, to be internally assessed, to engage students in work related to the Pearson-set Theme.

At Level 4, students will select a Topic to further define their approach to the Theme and assignment. At Level 5, it is expected that students will define their own Topic, in negotiation with tutors, based on the Pearson-set Theme.

For example, from the Higher Nationals in Computing:

- Theme: “The Internet of Things”

Level 4 Topics:

- Data mining and processing underpinning IoT activity and its implications
- Smart gadgets and their use in the home
- The future of the IoT and possibilities for health, AI, machine learning
- Expansion of IoT and the need for 5G and bandwidth

Centres can find relevant support in the Pearson-set Assignment Guidance for the units, and the Theme and Topic release documentation, which will be provided for each level.

The aim of the Pearson-set assignments is to provide a common framework for centres to develop work that will allow cross-sector benchmarking, through the standardisation of student work, and identification and sharing of ‘best practice’ in higher education teaching and learning. Pearson will share the ‘best practice’ results with all centres. For further information about Pearson-set assignments and assessment, see *Section 6* of this document.

4.4 The Unit Descriptor

The Unit Descriptor is how we define the individual units of study that make up a Higher National qualification. Students will study and complete the units included in the programme offered at your centre.

We have described each part of the unit, as below. You may refer to any of the Unit Descriptors in *Section 10* of this programme specification.

Unit Title	A broad statement of what the unit will cover.
Unit Code	The Ofqual unit designation
Unit Type	There are three unit types: core (mandatory to all pathways); specialist (mandatory to specific pathways); and optional (available to most pathways)
Unit level	All Higher National Certificate units are at Level 4 and all Higher National Diploma are at Level 5
Credit value	The credit value is related to total qualification time (TQT) and unit learning hours (ULH), and is easy to calculate. 1 credit is equal to 10 ULH, so 15 credits are equal to 150 ULH. To complete a Higher National Certificate or Diploma students are expected to achieve the appropriate number of credits
Introduction	Some general notes on the unit, setting the scene, stating the purpose, outlining the topics and skills gained on completion of the unit
Learning Outcomes	The Learning Outcomes are explicit statements that clearly express what students will be able to do after the completion of the unit. There are, typically, four Learning Outcomes for each unit.
Essential Content	This section covers the content that students can expect to study as they work towards achieving their Learning Outcomes.

Learning Outcomes and Assessment Criteria

Each unit sets out the 'Pass', 'Merit' and 'Distinction' criteria for that unit. When assignments are graded, a tutor will refer to this table, which connects the unit's Learning Outcomes with the student's work. This assignment may be graded at 'Pass', 'Merit' or 'Distinction level, depending on the quality of the students work.

Recommended Resources

Lists the resources appropriate to support the study of this unit. This includes books, journals and online material to support learning. The programme tutor may suggest alternatives and additions, usually with a local application or relevance.

Web resources – referencing:

Some units have web resources as part of their recommended resources lists. Hyperlinking to these resources directly can be problematic as locations and addresses of resources can change over time. To combat this we have referenced web resources as follows:

- [1] A link to the main page of the website
- [2] The title of the site
- [3] The name of the section or element of the website where the resource can be found
- [4] The type of resource it is, which may be one of the following –
 - research
 - general reference
 - tutorials
 - training
 - e-books
 - report
 - wiki
 - article
 - datasets
 - development tool
 - discussion forum

Web

- | | |
|--|-------------------------------|
| [1] www.lynda.com | [2] Lynda.com |
| | [3] Database Training |
| | [4] (Tutorials) |
| [1] mva.microsoft.com | [2] Microsoft Virtual Academy |
| | [3] Database Development |
| | [4] (Training) |

4.5 Professional Body Recognition

In developing the Pearson BTEC Higher National qualifications in Computing, we have worked closely with the The Institution of Engineering & Technology (IET) and the British Computing Society (BCS). With the agreement of the BCS, we have secured exemptions from certain membership types for students achieving Pearson BTEC Higher Nationals in Cloud Computing as follows:

- Student Member whilst studying
- Associate Member on graduation
- Exemption from 2 years IT related work experience towards becoming a Professional Member on graduation (3 years work experience as opposed to the normal 5 years).

All member grades will allow access to the Specialist Groups.

By aligning to professional body competency standards, the content and assessment supports student development as professional practitioners for the future. This adds value for students by offering them access to continuing professional development.

In some circumstances, professional bodies will enable students to gain certification of a professional qualification on completion of their Higher National in Computing. For additional professional body recognition and membership details for this qualification, please see our Progression Hub on HN Global where the most up to date information can be found: <https://hnglobal.highernationals.com/>.

The skills required to achieve a vendor accredited certificate have been included in specific units (see *Appendix 2* for unit combination details). Once these units have been completed a student can then put themselves forward for vendor accreditation via the vendor-specific route. Details of these routes are available below.

4.6 Alignment to Occupational Standards (IfATE)

A key aim of this redevelopment was to align the Computing qualification with the Occupational Standards designated by the Institute for Apprenticeships and Technical Education (IfATE). All of the Level 5 pathways are aligned to the following digital standards:

- General pathway aligned to Business Analyst
- Software Engineering Pathway aligned to Software Developer
- Applications Development Pathway aligned to Software Tester
- Data Analytics Pathway aligned to Data Analyst
- Network Engineering Pathway aligned to Network Engineer

- Security Pathway aligned to Cyber Security Technologist

On completion of the pathway at Level 4 and Level 5, a student will have met all the knowledge, skills and behaviours of the aligned standard.

4.7 Vendor Accreditation

In redeveloping the Pearson BTEC Higher National qualifications in Computing, we have worked closely with vendors to offer students the skills required to gain accredited certifications. Certifications from the following vendors will be available:

- CompTIA
- CISCO
- Huawei
- Microsoft
- Oracle
- AXELOS

Students will not automatically gain vendor accredited certificates as a result of studying a BTEC HNC and/or a BTEC HND. On completion of the relevant units of study (*see appendix 2*), students can apply to the individual vendor to sit the appropriate exam or provide the relevant evidence to gain certification.

CompTIA's vendor-neutral certifications are the starting point for a career in IT. They show employers you have the skills to do the job, regardless of the vendor hardware or software. Earning a CompTIA certification proves you have the right skills, and is the starting place for a career in IT.

- **CompTIA A+:** validates understanding of the most common hardware and software technologies and certifies the skills necessary to support complex IT infrastructures.
- **Network+:** validates the essential knowledge and skills needed to confidently design, configure, manage and troubleshoot any wired and wireless networks.
- **CompTIA Security+:** validates foundational, vendor-neutral IT security knowledge and skills. Covers the essential principles for Network Security and risk management.
- **CompTIA Cloud+:** validates the skills and expertise of IT practitioners in implementing and maintaining cloud technologies.
- **CompTIA Server+:** validates planning, securing and maintaining a variety of server equipment.
- **CompTIA Linux+:** certifies foundational skills and knowledge of Linux.

Details of how to take CompTIA Certification exams can be found on the Pearson Vue website (<http://www.pearsonvue.com/comptia/>).

CISCO is the largest networking company in the world and sponsor IT Professional certifications for CISCO products. CISCO Certifications and specialist qualifications are an IT industry standard used to validate knowledge of CISCO products and technologies. Getting certified brings measurable rewards and opens up further professional opportunities.

The updated curriculum CCNAv7.0 has been designed to prepare you for today's associate-level job roles in IT technologies. The CCNAv7.0 curriculum is one training program and one exam which leads to certification but is presented in three courses that cover a broad range of fundamentals and provide integrated and comprehensive coverage of networking topics. The essential principles and skills for two of the three courses are covered through studying the relevant units.

- Introduction to Networks (ITN)
- Switching, Routing and Wireless Essentials (SRWE)

The previous version of the CISCO certifications which are covered by the Higher National Diploma, remain in scope until their certification expiry. These were as follows:

- CISCO IT Essentials: covers fundamental computer and career skills for entry-level IT jobs.
- CISCO CCNA Routing & Switching: covers knowledge of foundational technologies and skill sets needed for the adoption of next generation networking technologies.
- CISCO CCNA Security: covers skills required to develop a security infrastructure, recognise threats and vulnerabilities to networks, and mitigate security threats.

For students to be in a position to achieve CISCO accredited certification the relevant units must be delivered using CISCO technologies.

Students who study these units with non-CISCO technologies will achieve a BTEC Higher National Diploma but will not have the skills necessary to take CISCO Certification assessments.

Details of how to take CISCO Certification exams can be found on the Pearson Vue website (<http://www.pearsonvue.com/cisco/>).

Huawei Certification provide leading talent certification standards across four key domains; telecoms networks, IT, smart devices, and cloud services. Huawei offers three levels of certification: Huawei Certified ICT Associate (HCIA), Huawei Certified ICT Professional (HCIP), and Huawei Certified ICT Expert (HCIE)

The Huawei Certified ICT Associate (HCIA) offers foundational training and certification with small and medium-sized enterprise network deployment and O&M capabilities and is the basis of progression to professional (HCIP) and expert (HCIE) status. The mapping in this qualification is at HCIA level.

For students to be in a position to achieve the Huawei certification, the relevant units must incorporate the use of Huawei technologies.

Further information on how to take the exam can be found on the Pearson Vue website <https://home.pearsonvue.com/Clients/Huawei.aspx>

Microsoft Office is a bundled set of applications which includes Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. A Microsoft Certification validates your expertise in Microsoft technology. Passing your first Microsoft Certification exam automatically makes you a member of the Microsoft Certified Professional (MCP) community, with access to all of the benefits provided through the MCP.

- Microsoft Office Specialist: allows you demonstrate the skills needed to get the most out of Microsoft Office.

Details of how to take the various Microsoft Office exams can be found on the Microsoft learning website (<https://www.microsoft.com/en-us/learning/>).

Oracle is a leading database software company and has developed technologies into the entire technology stack. The Oracle Certification Program certifies candidates on skills and knowledge related to Oracle products and technologies.

- Java SE 8 Fundamentals: validates skills in object-oriented programming using the Java language.
- Oracle Database Introduction to SQL: validates skills in the SQL programming language.
- Oracle Database 12c Administration: validates understanding of the Oracle Database architecture.

For students to be in a position to achieve Oracle accredited certification the relevant units must be delivered using Java and/or SQL.

Students who study these units with non-Oracle technologies will achieve a BTEC Higher National Diploma, but will not have the skills necessary to take Oracle's certification assessments.

Details of how to take Oracle Certification exams are available on the Pearson Vue website (<http://www.pearsonvue.com/oracle/>).

AXELOS is a joint venture set up by the Government of the UK and Capita, to develop, manage and operate qualifications in best practice methodologies.

- Prince 2 Foundation Qualification: confirms sufficient knowledge and understanding of the PRINCE2 method to be able to work effectively with, or as a member of, a project management team.
- RESILIA Foundation Qualification: verifies understanding of how decisions impact good/bad cyber resilience.

Details of how to take the various exams are available in the links below:

- Prince 2 Foundation (<http://www.axelos.com/certifications/>).
- RESILIA Foundation (<https://www.axelos.com/certifications/>).

See *Appendix 2* for an outline of the unit combinations students must take to be in a position to gain the relevant vendor certifications.

5 Teaching and learning

The aim of this section is to provide guidance to centres so that they can engage students in a dynamic, interactive and reflective learning experience. This experience should effectively prepare students to successfully engage in the assessments, which will measure depth, as well as breadth, of knowledge. Teaching should stimulate academic engagement, develop challenging yet constructive discourse and encourage students to reflect on their own performance in preparation for a professional career. Additionally, centres are encouraged to expose students to autonomous and independent learning, which will facilitate the development of their academic skills, experiences and techniques required as they progress from one level of study to the next.

Centres are encouraged to develop programmes that have a distinctive focus on entry into work, delivering a curriculum that embeds employability, has a strong commitment to ethics and diversity, and introduces students to contemporary as well as seminal research. All teaching and learning should reflect the expectations of employers and society and be informed and guided by external benchmarks such as professional and statutory bodies. In so doing students completing a Pearson BTEC Higher National qualification in Computing will have the attributes, skills, principles and behaviours that will enable them to make a valuable contribution to local, national and international commerce.

The contributions students make to their own experiences, alongside the experience of their peers, is invaluable. Student engagement and the student voice should form a significant aspect of a student's life. Centres are encouraged to gather student opinions on a range of teaching and learning matters, which would be used to inform and enhance future practice within a programme of study and within a centre.

5.1 Delivering quality and depth

A high-quality teaching and learning experience should include qualified and experienced tutors, an interactive and engaging curriculum, motivated and inspired students, and a support system that caters for the pastoral as well as academic interests of students.

In addition to delivering a quality learning experience, centres must also encourage students to have a deeper understanding of the subject where they are able to go beyond the fundamentals of explaining and describing. Students are expected to show they can analyse data and information, make sense of this and then reach evaluative judgements. At the higher levels of study there is an expectation that students will be able to apply a degree of criticality to their synthesis of knowledge. This criticality would come from exposure to appropriate and relevant theories, concepts and models.

One of the reasons for delivering a quality learning experience, which has depth as well as breadth, is the benchmarking of the qualification to the Framework for Higher Education Qualifications (FHEQ). It also meets requirements set by the Regulated Qualifications Framework (RQF). The first stage of a Pearson BTEC Higher National in Computing is the BTEC Higher National Certificate (HNC), which is aligned with Level 4 of both frameworks; with the BTEC Higher National Diploma (HND) aligned with Level 5. This means that the HNC has the same level of demand and expectations as the first year of a degree programme, with the HND having the same level of demand and expectations as the second year of a degree programme.

Centres are expected to provide a broadly similar experience for students to that which they would have if they attended a similar programme at a university. This could mean:

- Providing access to library facilities which has, as a minimum, available copies (physically and/or electronically) of all required reading material
- Access to research papers and journals
- Utilising a Virtual Learning Environment (VLE) to support teaching and learning
- Working with local employers (see below) to present real-life case studies
- Creating schemes of work that embrace a range of teaching and learning techniques
- Listening to the student voice.

Irrespective of the type of programme on which a student is enrolled, it is highly advisable that students are inducted onto their BTEC Higher National programme. This induction should include an introduction to the course programme and academic study skills that will be essential in supporting their research and studies, and, therefore, enhance the learning experience.

An induction programme should consist of the following:

- Course programme overview
- Preparing for lessons
- Effective engagement in lectures and seminars
- Making the most out of their tutor
- Assignment requirements
- Referencing and plagiarism
- Centre policies
- Academic study skills.

Pearson offer Higher National Global Study Skills to all students– an online toolkit that supports the delivery, assessment and quality assurance of BTECs in centres. This is available on the HN Global website www.highernationals.com. HN Global provides a wealth of support to ensure that tutors and students have the best possible experience during their course. With HN Global, students can converse with other students from around the world, find useful training on how to prepare for their studies and get access to comprehensive online career services.

5.2 Engaging with employers

Just as the student voice is important, so too is the employer's. Employers play a significant role in the design and development of all regulated qualifications, including the Pearson BTEC Higher Nationals in Computing. This input should extend into the learning experience, where engagement with employers will add value to students, particularly in transferring theory into practice.

Centres should consider a range of employer engagement activities. These could include:

- Field trips to local businesses
- Inviting members of the local computing community to present guest lectures
- Using employers to judge the quality of assessed presentations and/or products
- Coding Challenges set by local employer.

While detailed guidance on assessment has been provided in this specification (see Section 6), it is worth considering the involvement of employers when determining assessment strategies and the use of different assessment vehicles. This enables centres to design assessments that are more closely related to what students would be doing in the workplace. Employers are able to comment on relevance and content, as well as the challenge presented by an assessment. Notwithstanding this, ultimately it is the centre's responsibility to judge the extent to which any employer contributes to teaching and learning.

5.3 Engaging with students

Students are integral to teaching and learning. As such it is important that they are involved as much as possible with most aspects of the programme on to which they are enrolled. This input could include taking into account their views on how teaching and learning will take place, their role in helping to design a curriculum, or on the assessment strategy that will test their knowledge and understanding.

There are many ways in which to capture the student voice and student feedback, both formal and informal. Formal mechanisms include the nomination of student representatives to act as the collective student voice for each student cohort, student representation at course team meetings, and an elected higher education representative as part of the Student Union. Student forums should also take place periodically throughout the year with minutes and action plans updated and informing the overall annual course monitoring process. Unit specific feedback can also be collated by students completing unit feedback forms, end of year course evaluations, and scheduled performance review meetings with their tutor.

However, this should not be the only time when feedback from students is sought. Discourse with students should be constant, whereby teachers adopt a 'reflection on action' approach to adjust teaching, so that students are presented with an environment that is most supportive of their learning needs. Just as employers could have an input into assessment design, so too could students. This will support the development of assignments that are exciting and dynamic, and fully engage students in meaningful and informative assessment.

The biggest advantage of consulting students on their teaching, learning and assessment is securing their engagement in their own learning. Students are likely to feel empowered and develop a sense of ownership of all matters related to teaching, learning and assessment, not just their own experiences. Students could also view themselves as more accountable to their tutors, ideally seeing themselves as partners in their own learning and not just part of a process.

5.4 Planning and structuring a programme

Learning should be challenging yet exciting; teaching should be motivating and inspirational. Consequently, both teaching and learning should form part of a programme structure that is active, flexible and progressive, and has an industry focus wherever possible.

It is important for a programme structure to be effectively planned, taking into account the nature of the student cohort, the primary mode of delivery (face-to-face or distance learning) and the level of study. It is also advisable to consider the student voice (whether that voice is heard through end of programme feedback, or through ongoing dialogue) when planning how and when students will be exposed to a particular subject. One other vital source of information that centres would do well to embrace is the feedback from tutors who have been and/or will be delivering learning.

It is recommended that centres establish a programme planning forum where various stakeholders are represented. This forum could consider different perspectives of teaching and learning and how these are planned into an effective programme structure. Consideration could be given to, for example, the holistic and consistent use of Virtual Learning Environments (VLEs), a programme of field trips, a strategy for engaging with employers, and how and when to assess learning.

Consideration should be given to a number of factors when planning a programme structure. These include:

- The sequencing of units
- Whether to have condensed or expanded delivery
- Teaching and learning techniques.

5.4.1 Sequencing units

The level of demand embedded within a unit is benchmarked to recognised standards. This applies to all units within a level of study, and this means that all Level 4 units have similar demands, as do all Level 5 units. However, this does not mean that units can, or should, be delivered in any order. For example, in the BTEC Higher National Diploma in Computing Level 4 units are delivered, and achieved, by students before progression to Level 5. However, students are able to progress to Level 5 with a minimum of 90 credits at Level 4.

Within each level it is advisable to sequence units so that those providing fundamental knowledge and understanding are scheduled early in the programme. It may also be advisable to schedule the assessment of units requiring the practice and application of more advanced skills later in the programme.

5.4.2 Condensed, expanded or mixed delivery

The next consideration is whether to deliver a unit in a condensed format alongside other units, or to deliver units over an extended period, or a combination of these. The following tables provide examples of this, based on four units being delivered in one teaching block.

Condensed version:

Weeks 1 to 6	Week 7	Weeks 8 to 13	Week 14
Unit 1	Assessment	Unit 3	Assessment
Unit 2		Unit 4	

Expanded version:

Weeks 1 to 12		Weeks 13 and 14	
Unit 1	Assessment		
Unit 2			
Unit 3			
Unit 4			

Mixed version:

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Unit 1													Assessment
Unit 2					Assessment	Unit 3							

The decision to deliver a condensed, expanded or mixed programme would depend on a number of factors, including availability of resources, the subjects to be taught and the requirements of students. Each version has advantages: the condensed version would provide an opportunity for students to gain early success and achievement. This will enhance their self-efficacy, the sense of one's belief in one's ability to succeed, and self-confidence, with tutors being able to identify and respond to less able students early in the teaching and learning cycle.

The advantages of the expanded version include providing a longer timescale for students to absorb new knowledge and therefore, potentially, improve success, and giving tutors an opportunity to coach and support less able students over a longer period of time. The mixed version, with some units spanning over the entire period and others lasting for shorter periods, provides opportunities for learning in some units to support development in others. This format may be particularly suited to a combination of practical and theoretical units. In all cases, the choice of which type of unit sequence must consider student opportunities as well as staff and physical resources of the centre.

As there are pros and cons to each approach, the use of a planning forum would help to ensure the most appropriate approach is taken. For example, centres could choose to deliver the first teaching block using the expanded version, with the subsequent teaching block being delivered through a condensed approach.

It should be noted that the above consideration would apply equally to programmes that are being delivered face-to-face or through distance learning.

5.4.3 Drawing on a wide range of delivery techniques

As part of planning the range of techniques that will be used to deliver the syllabus, centres should also consider an appropriate combination of techniques for the subject.

The table below lists some of the techniques that centres could introduce into a planned programme structure.

Technique	Face-to-face	Distance learning
Lectures and seminars	These are the most common techniques used by tutors. They offer an opportunity to engage with a large number of students, where the focus is on sharing knowledge through the use of presentations.	Delivery would be through video conferencing and/or pre-recorded audio and/or visual material, available through an online platform. Synchronous discussion forums could also be used.
Workshops	These are used to build on knowledge shared via tutors and seminars. Teaching can be more in-depth where knowledge is applied, for example to case studies or real-life examples. Workshops could be student-led, where students present, for example, findings from independent study.	While more challenging to organise than for face-to-face delivery, workshops should not be dismissed. Smaller groups of three or four students could access a forum simultaneously and engage in the same type of activity as for face-to-face.

Technique	Face-to-face	Distance learning
Tutorials	These present an opportunity for focused one-to-one support, where teaching is led by an individual student's requirements. These can be most effective in the run up to assessment, where tutors can provide more focused direction, perhaps based on a formative assessment.	Other than not necessarily being in the same room as a student, tutors could still provide effective tutorials. Video conferencing tools provide the means to see a student, which makes any conversation more personal.
Virtual Learning Environments (VLEs)	These are invaluable to students studying on a face-to-face programme. Used effectively, VLEs not only provide a repository for taught material such as presentation slides or hand-outs, but could be used to set formative tasks such as quizzes. Further reading could also be located on a VLE, along with a copy of the programme documents, such as the handbook and assessment timetable.	Where students are engaged with online delivery through distance or blended learning a VLE is a must, as this would be the primary or the key source of learning. Where distance learning is primarily delivered through hard copies of workbooks, etc., the same principle would apply as for face-to-face learning.
Blended learning	The combination of traditional face-to-face learning and online learning. This can enable the students to gain personalised support, instruction and guidance while completing assigned activities and tasks remotely.	Offline learning enables students to develop autonomy and self-discipline by completing set activities and tasks with limited direction and traditional classroom-based constraints.
Work-based learning	Any opportunity to integrate work-based learning into a curriculum should be taken. This adds realism and provides students with an opportunity to link theory to practice in a way in which case studies do not. Many full-time students are involved in some form of employment, either paid or voluntary, which could be used, where appropriate, as part of their learning, for example when assignments require students to contextualise a response to a real organisation.	It is likely that the majority of distance learning students would be employed and possibly classed as mature students. Bringing theory to life through a curriculum, which requires work-based application of knowledge, would make learning for these students more relevant and meaningful. Perhaps more importantly, assessment should be grounded in a student's place of work, wherever possible.

Technique	Face-to-face	Distance learning
Guest speakers	These could be experts from industry or visiting academics in the subject area that is being studied. They could be used to present a lecture/seminar, a workshop or to contribute to assessment. The objective is to make the most effective use of an expert's knowledge and skill by adding value to the teaching and learning experience.	As long as the expert has access to the same platform as the students then the value added contribution would still be very high. Consideration would need to be given to timings and logistics, but with some innovative management this technique would still have a place in distance learning programmes.
Field trips	Effectively planned field trips, which have a direct relevance to the syllabus, will add value to the learning experience. Through these trips students can relate theory to practice, have an opportunity to experience organisations in action, and potentially open their minds to career routes.	The use of field trips can be included as part of a distance learning programme. They will add the same value and require the same planning. One additional benefit of field trips for distance learning is that they provide an opportunity for all students in a cohort to meet, which is a rare occurrence for distance learning students.

5.4.4 Assessment considerations

Centres should design assessment for learning. This is where an assessment strategy requires students to engage with a variety of assessment tools that are accessible, appropriately challenging, and support the development of student self-efficacy and self-confidence. To ensure that assignments are valid and reliable, centres must implement robust quality assurance measures and monitor the effectiveness of their implementation (see Section 6 of this Programme Specification). This includes ensuring that all students engage in assessment positively and honestly.

Assessment also provides a learning opportunity for all stakeholders of the assessment to have access to feedback that is both individual to each student and holistic to the cohort. Feedback to students should be supportive and constructive. Student self-efficacy (and therefore self-confidence) can be significantly enhanced where feedback not only focuses on areas for improvement, but recognises the strengths a student has. At the cohort level, similar trends could be identified that inform future approaches to assessments and teaching. Assessment is an integral part of the overall learning process and assessment strategy must be developed to support effective, reflective, thinking computing practitioners for the future. Assessment can be either formative, summative or both.

5.4.5 Formative assessment

Formative assessment is primarily developmental in nature and designed to give feedback to students on their performance and progress. Assessment designed formatively should develop and consolidate knowledge, understanding, skills and competencies. It is a key part of the learning process and can enhance learning and contribute to raising standards.

Through formative assessment tutors can identify students' differing learning needs early on in the programme and so make timely corrective interventions. Tutors can also reflect on the results of formative assessment to measure how effective the planned teaching and learning is at delivering the syllabus. Each student should receive one set of written formative feedback, otherwise some students may feel that others are being given more than their share of verbal feedback.

5.4.6 Summative assessment

Summative assessment is where students are provided with the assignment grades contributing towards the overall unit grade. For summative assessment to be effective it should also give students additional formative feedback to support ongoing development and improvement in subsequent assignments. All formative assessment feeds directly into the summative assessment for each unit and lays the foundations from which students develop the necessary knowledge and skills required for the summative assessment.

5.4.7 Assessment feedback

Effective assessment feedback is part of continuous guided learning which promotes learning and enables improvement. It also allows students to reflect on their performance and helps them understand how to make effective use of feedback. Constructive and useful feedback should enable students to understand the strengths and limitations of their performance, providing positive comments where possible as well as explicit comments on how improvements can be made. Feedback should reflect the learning outcomes and assessment criteria to also help students understand how these inform the process of judging the overall grade.

The timing of the provision of feedback and of the returned assessed work also contributes to making feedback effective. Specific turnaround time for feedback should be agreed and communicated with both tutors and students. Timing should allow students the opportunity to reflect on the feedback and consider how to make use of it in forthcoming assessments, taking into account the tutor's workload and ability to provide effective feedback.

5.4.8 Designing valid and reliable assessments

To help ensure valid and reliable assignments are designed and are consistent across all units, centres could consider a number of actions.

Use of language

The first aspect of an assignment that a centre could focus on is ensuring that language makes tasks/questions more accessible to students.

Due consideration must be given to the command verbs (i.e. the verbs used in unit assessment criteria) when considering the Learning Outcomes of a unit. Assignments must use appropriate command verbs that equate to the demand of the Learning Outcome. If the outcome requires 'analysis' then 'evaluative' requirements within the assignment must not be set when testing that outcome. This would be viewed as over-assessing. Similarly, it is possible to under-assess where analytical demands are tested using, for example, explanatory command verbs.

The following can be used as a guide to support assignment design:

- Ensure there is a holistic understanding (by tutors and students) and use of command verbs.
- Set assignment briefs that use a single command verb, focusing on the highest level of demand expected for the Learning Outcome(s) that is (are) being tested.
- Assignments should be supported by additional guidance that helps students to interpret the demand of the assessment criteria.
- Time-constrained assessments should utilise the full range of command verbs (or acceptable equivalents) appropriate to the academic level. Modes of time-constrained assessments include in-class tests and exams that could be both open- or closed-book. Centres should pay close consideration to ensuring tests and exams are not replicated during the course of the year.

Consistency

This relates to the consistency of presentation and structure, the consistent use of appropriate assessment language, and the consistent application of grading criteria. Where assignments are consistent, reliability is enhanced. Where validity is present in assignments this will result in assignments that are fit for purpose and provide a fair and equitable opportunity for all students to engage with the assignment requirements.

Employing a range of assessment tools

Just as variation in teaching methods used is important to the planning of a programme structure, so too is the use of a range of assessment tools appropriate to the unit and its content. Centres should consider taking a holistic view of assessment, ensuring a balanced assessment approach with consideration given to the subject being tested and what is in the best interests of students. As mentioned above, consultation with employers could add a sense of realism to an assessment strategy. (A comprehensive list of assessment tools is provided in section 6.2 *Setting effective assessments*.)

No matter what tool is used, assignments should have a sector focus (whether this is in a workplace context or through a case study), and be explicitly clear in its instructions. In the absence of a case study a scenario should be used to provide some context. Finally, students should be clear on the purpose of the assignment and which elements of the unit it is targeting.

6 Assessment

BTEC Higher Nationals in Computing are assessed using a combination of internally assessed **centre-devised internal assignments** (which are set and marked by centres) and internally assessed **Pearson-set assignments** (which are set by Pearson and marked by centres). Pearson-set assignments are mandatory and target particular industry-specific skills. The number and value of these units are dependent on qualification size:

For the HNC, one Core, 15 credit, unit at Level 4 will be assessed by a mandatory Pearson-set assignment targeted at particular skills.

For the HND, two Core units: one Core, 15 credit, unit at Level 4 and one Core, 30 credit, unit at Level 5, will be assessed by a mandatory Pearson-set assignment targeted at particular skills.

All other units in both qualifications are assessed by centre-devised internal assignments.

The purpose and rationale of having Pearson-set units on Higher Nationals is as follows:

- **Standardisation of student work** – Assessing the quality of student work, that it is meeting the level and the requirements of the unit across all centres, that grade decisions and assessor feedback are justified and that internal verification and moderation processes are picking up any discrepancies and issues.
- **Sharing of good practice** – We will share good practice in relation to themes such as innovative approaches to delivery, the use of digital literacy, enhancement of student employability skills and employer engagement. **These themes will align to those for QAA Higher Education Reviews.**

An appointed External Examiner (EE) for the centre will ask to sample the Pearson-set assignment briefs in advance of the external examination visit. Although this is not a mandatory requirement for centres, we strongly advise that centres seek guidance and support from their EE on the Pearson-set assignments. The EE may also include the Pearson-set units in their sample of student work during their centre visit.

We have taken great care to ensure that the assessment method chosen is appropriate to the content of the unit and in line with requirements from professional bodies, employers and higher education.

In developing an overall plan for delivery and assessment for the programme, you will need to consider the order in which you deliver units, whether delivery will take place over short or long periods of time, and when assessment can take place.

6.0.1 Example Assessment Briefs

Each unit has supporting Example Assessment Briefs that are available to download from the course materials section on our website (<http://qualifications.pearson.com>). The Example Assessment Briefs are there to give you an example of what the assessment will look like in terms of the feel and level of demand of the assessment.

The Example Assessment Briefs, with the exception of the mandatory Pearson-set unit, provide tutors with suggested types of assignment and structure that can be adopted and, if so, **must** be adapted accordingly.

6.1 Principles of internal assessment

This section gives an overview of the key features of internal assessment and how you, as an approved centre, can offer it effectively. The full requirements and operational information are given in the Pearson Quality Assurance Handbook available in the support section of our website (<http://qualifications.pearson.com/>). All the assessment team will need to refer to this document.

For Pearson BTEC Higher Nationals it is important that you can meet the expectations of stakeholders and the needs of students by providing a programme that is practical and applied. Centres can tailor programmes to meet local needs and should use links with local employers and the wider computing sector.

When internal assessment is operated effectively it is challenging, engaging, practical and up to date. It must also be fair to all students and meet national standards.

6.1.1 Assessment through assignments

For internally assessed units the format of assessment is an assignment taken after the content of the unit, or part of the unit if several assignments are used, has been fully delivered. An assignment may take a variety of forms, including practical and written types. An assignment is a distinct activity completed independently by students (either alone or in a team). An assignment is separate from teaching, practice, exploration and other activities that students complete with direction from and, formative assessment by, tutors.

An assignment is issued to students as an **assignment brief** with a hand-out date, a completion date and clear requirements for the evidence that students are expected to provide. There may be specific observed practical components during the assignment period. Assignments can be divided into separate parts and may require several forms of evidence. A valid assignment will enable a clear and formal assessment outcome based on the assessment criteria.

6.1.2 Assessment decisions through applying unit-based criteria

Assessment decisions for Pearson BTEC Higher Nationals are based on the specific criteria given in each unit and set at each grade level. The criteria for each unit have been defined according to a framework to ensure that standards are consistent in the qualification and across the suite as a whole. The way in which individual units are written provides a balance of assessment of understanding, practical skills and vocational attributes appropriate to the purpose of the qualifications.

The assessment criteria for a unit are hierarchical and holistic. For example, if an M criterion requires the student to show 'analysis' and the related P criterion requires the student to 'explain', then to satisfy the M criterion a student will need to cover both 'explain' and 'analyse'. The unit assessment grid shows the relationships among the criteria so that assessors can apply all the criteria to the student's evidence at the same time. In *Appendix 5* we have set out a definition of terms that assessors need to understand.

Assessors must show how they have reached their decisions using the criteria in the assessment records. When a student has completed all the assessment for a unit then the assessment team will give a grade for the unit. This is given simply according to the highest level for which the student is judged to have met all the criteria. Therefore:

- **To achieve a Pass**, a student must have satisfied all the Pass criteria for the Learning Outcomes, showing coverage of the unit content and therefore attainment at Level 4 or 5 of the national framework.
- **To achieve a Merit**, a student must have satisfied all the Merit criteria (and therefore the Pass criteria) through high performance in each Learning Outcome.
- **To achieve a Distinction**, a student must have satisfied all the Distinction criteria (and therefore the Pass and Merit criteria), and these define outstanding performance across the unit as a whole.

The award of a Pass is a defined level of performance and cannot be given solely on the basis of a student completing assignments. Students who do not satisfy the Pass criteria should be reported as Unclassified.

6.1.3 The assessment team

It is important that there is an effective team for internal assessment. There are three key roles involved in implementing assessment processes in your centre, each with different interrelated responsibilities, and these roles are listed below. Full information is given in the Pearson Quality Assurance Handbook available in the support section of our website (<http://qualifications.pearson.com/>).

- **The Programme Leader** has overall responsibility for the programme, its assessment and internal verification to meet our requirements, record keeping and liaison with the EE. The Programme Leader registers annually with Pearson and acts as an assessor, supports the rest of the assessment team, makes sure

they have the information they need about our assessment requirements, and organises training, making use of our guidance and support materials.

- **Internal Verifiers** (IVs) oversee all assessment activity in consultation with the Programme Leader. They check that assignments and assessment decisions are valid and that they meet our requirements. IVs will be standardised by working with the Programme Leader. Normally, IVs are also assessors, but they do not verify their own assessments.
- **Assessors** set or use assignments to assess students to national standards. Before taking any assessment decisions, assessors participate in standardisation activities led by the Programme Leader. They work with the Programme Leader and IVs to ensure that the assessment is planned and carried out in line with our requirements.
- Your **EE** will sample student work across assessors. Your EE will also want to see evidence of informal verification of assignments and assess decisions.

6.1.4 Effective organisation

Internal assessment needs to be well organised so that student progress can be tracked and so that we can monitor that assessment is being carried out in line with national standards. We support you in this through, for example, providing training materials and sample documentation. Our online HN Global service can also help support you in planning and record keeping.

It is particularly important that you manage the overall assignment programme and deadlines to make sure that all your students are able to complete assignments on time.

6.1.5 Student preparation

To ensure that you provide effective assessment for your students, you need to make sure that they understand their responsibilities for assessment and the centre's arrangements. From induction onwards you will want to ensure that students are motivated to work consistently and independently to achieve the requirements of the qualifications. They need to understand how assignments are used, the importance of meeting assignment deadlines, and that all the work submitted for assessment must be their own.

You will need to give your students a guide that explains:

- How assignments are used for assessment
- How assignments relate to the teaching programme
- How students should use and reference source materials, including what would constitute plagiarism.

The guide should also set out your centre's approach to operating assessments, such as how students must submit assignments/work and the consequences of submitting late work and the procedure for requesting extensions for mitigating circumstances.

6.2 Setting effective assessments

6.2.1 Setting the number and structure of assessments

In setting your assessments you need to work with the structure of assessments shown in the relevant section of a unit. This shows the learning aims and outcomes and the criteria that you are expected to follow.

Pearson provide online EABs for each unit to support you in developing and designing your own assessments.

In designing your own assignment briefs you should bear in mind the following points:

- The number of assignments for a unit must not exceed the number of Learning Outcomes listed in the unit descriptor. However, you may choose to combine assignments, either to cover a number of Learning Outcomes or to create a single assignment for the entire unit.
- You may also choose to combine all or parts of different units into single assignments, provided that all units and all their associated Learning Outcomes are fully addressed in the programme overall. If you choose to take this approach you need to make sure that students are fully prepared, so that they can provide all the required evidence for assessment, and that you are able to track achievement in assessment records.
- A learning outcome must always be assessed as a whole and must not be split into two or more elements.
- The assignment must be targeted to the Learning Outcomes but the Learning Outcomes and their associated criteria are not tasks in themselves. Criteria are expressed in terms of the outcome shown in the evidence.

You do not have to follow the order of the Learning Outcomes of a unit in setting assignments, but later Learning Outcomes often require students to apply the content of earlier Learning Outcomes, and they may require students to draw their learning together.

Assignments must be structured to allow students to demonstrate the full range of achievement at all grade levels. Students need to be treated fairly by being given the opportunity to achieve a higher grade, if they have the ability.

As assignments provide a final assessment, they will draw on the specified range of teaching content for the Learning Outcomes. **The specified unit content must be taught/delivered.** The evidence for assessment need not cover every aspect of the teaching content, as students will normally be given particular examples, case studies or contexts in their assignments. For example, if a student is carrying out one practical performance, or an investigation of one organisation, then they will address all the relevant range of content that applies in that instance.

6.2.2 Providing an assignment brief

A good assignment brief is one that, through providing challenging and authentic sector/work-related tasks, motivates students to provide appropriate evidence of what they have learnt.

An assignment brief should have:

- A vocational scenario: this could be a simple situation or a full, detailed set of vocational requirements that motivates the student to apply their learning through the assignment.
- Clear instructions to the student about what they are required to do, normally set out through a series of tasks.
- An audience or purpose for which the evidence is being provided.
- An explanation of how the assignment relates to the unit(s) being assessed.

6.2.3 Forms of evidence

Pearson BTEC Higher Nationals have always allowed for a variety of forms of assessment evidence to be used, provided they are suited to the type of Learning Outcomes being assessed. For many units, the practical demonstration of skills is necessary and, for others, students will need to carry out their own research and analysis, working independently or as part of a team.

The Example Assessment Briefs give you information on what would be suitable forms of evidence to give students the opportunity to apply a range of employability or transferable skills. Centres may choose to use different suitable forms of evidence to those proposed. Overall, students should be assessed using varied forms of evidence.

These are some of the main types of assessment:

- Written reports, essays
- In-class tests
- Examinations
- Creation of design documents
- Creation of implementation documents
- Work-based projects

- Academic posters, displays, leaflets
- PowerPoint (or similar) presentations
- Recordings of interviews/role plays
- Working logbooks, reflective journals
- Presentations with assessor questioning
- Time-constrained assessment.

(Full definitions of different types of assessment are given in *Appendix 6*.) The form(s) of evidence selected must:

- Allow the student to provide all the evidence required for the Learning Outcomes and the associated assessment criteria at all grade levels.
- Allow the student to produce evidence that is their own independent work.
- Allow a verifier to independently reassess the student to check the assessor's decisions.

For example, when you are using performance evidence, you need to think about how supporting evidence can be captured through recordings, photographs or task sheets.

Centres need to take particular care that students are enabled to produce independent work. For example, if students are asked to use real examples, then best practice would be to encourage them to use examples of their own or to give the group a number of examples that can be used in varied combinations.

6.3 Making valid assessment decisions

6.3.1 Authenticity of student work

An assessor must assess only student work that is authentic, i.e. the student's own independent work. Students must authenticate the evidence that they provide for assessment through signing a declaration stating that it is their own work. A student declaration must state that:

- Evidence submitted for the assignment is the student's own
- The student understands that false declaration is a form of malpractice.

Assessors must ensure that evidence is authentic to a student through setting valid assignments and supervising them during the assessment period. Assessors must also take care not to provide direct input, instructions or specific feedback that may compromise authenticity.

Centres may use Pearson templates or their own templates to document authentication.

During assessment an assessor may suspect that some or all of the evidence from a student is not authentic. The assessor must then take appropriate action using the centre's policies for malpractice. (See *section 3.7* in this Programme Specification for further information.)

6.3.2 Making assessment decisions using criteria

Assessors make judgements using the criteria. The evidence from a student can be judged using all the relevant criteria at the same time. The assessor needs to make a judgement against each criterion that evidence is present and sufficiently comprehensive. For example, the inclusion of a concluding section may be insufficient to satisfy a criterion requiring 'evaluation'.

Assessors should use the following information and support in reaching assessment decisions:

- The explanation of key terms in *Appendix 5* of this document
- Examples of verified assessed work
- Your Programme Leader and assessment team's collective experience.

6.3.3 Dealing with late completion of assignments

Students must have a clear understanding of the centre's policy on completing assignments by the deadlines that you give them. Students may be given authorised extensions for legitimate reasons, such as illness, at the time of submission, in line with your centre policies (see also *Section 3.6 "Administrative arrangements for internal assessment"*).

For assessment to be fair, it is important that students are all assessed in the same way and that some students are not advantaged by having additional time or the opportunity to learn from others. Centres should develop and publish their own regulations on late submission; and, this should make clear the relationship between late submission and the centre's mitigating circumstances policy.

Centres may apply a penalty to assignments that are submitted beyond the published deadline. However, if a late submission is accepted, then the assignment should be assessed normally, when it is submitted, using the relevant assessment criteria; with any penalty or cap applied after the assessment. Where the result of assessment may be capped, due to late submission of the assignment, the student should be given an indication of their uncapped grade; in order to recognise the learning that has been achieved, and assessment feedback should be provided in relation to the uncapped achievement.

As with all assessment results, both the uncapped and capped grades should be recorded and ratified by an appropriate assessment board; taking into account any mitigating circumstances that may have been submitted.

6.3.4 Issuing assessment decisions and feedback

Once the assessment team has completed the assessment process for an assignment, the outcome is a formal assessment decision. This is recorded formally and reported to students. The information given to the student:

- Must show the formal decision and how it has been reached, indicating how or where criteria have been met.
- May show why attainment against criteria has not been demonstrated.
- Must not provide feedback on how to improve evidence but how to improve in the future.

6.3.5 Resubmission opportunity

An assignment provides the final assessment for the relevant Learning Outcomes and is normally a final assessment decision. A student who, for the first assessment opportunity, has failed to achieve a Pass for that unit specification **shall be expected to undertake a reassessment**.

- Only one opportunity for reassessment of the unit will be permitted.
- Reassessment for course work, project- or portfolio-based assessments shall normally involve the reworking of the original task.
- For examinations, reassessment shall involve completion of a new task.
- A student who undertakes a reassessment will have their grade capped at a Pass for that unit.
- A student will not be entitled to be reassessed in any component of assessment for which a Pass grade or higher has already been awarded.

6.3.6 Repeat units

A student who, for the first assessment opportunity and resubmission opportunity, still failed to achieve a Pass for that unit specification:

- At Centre discretion and Assessment Board, decisions can be made to permit a repeat of a unit
- The student must study the unit again with full attendance and payment of the unit fee
- The overall unit grade for a successfully completed repeat unit is capped at a Pass for that unit
- Units can only be repeated once.

6.3.7 Assessment Boards

Each centre is expected by Pearson to hold Assessment Boards for all of its Pearson BTEC Higher National programmes. The main purpose of an Assessment Board is to make recommendations on:

- The grades achieved by students on the individual units
- Extenuating circumstances
- Cases of cheating and plagiarism
- Progression of students on to the next stage of the programme
- The awards to be made to students
- Referrals and deferrals.

Assessment Boards may also monitor academic standards. The main boards are normally held at the end of the session, although if your centre operates on a semester system there may be (intermediate) boards at the end of the first semester. There may also be separate boards to deal with referrals.

Where a centre does not currently have such a process then the EE should discuss this with the Quality Nominee and Programme Leader, stressing the requirement for Assessment Boards by both Pearson and QAA and that Assessment Board reports and minutes provide valuable evidence for QAA's Review of Higher Education process.

6.4 Planning and record keeping

For internal processes to be effective, an assessment team needs to be well organised and keep effective records. The centre will also work closely with us so that we can quality assure that national standards are being satisfied. This process gives stakeholder's confidence in the assessment approach.

The Programme Leader should have an assessment plan. When producing a plan the assessment team will wish to consider:

- The time required for training and standardisation of the assessment team.
- The time available to undertake teaching and carrying out of assessment, taking account of when students may complete external assessments and when quality assurance will take place.
- The completion dates for different assignments.
- Who is acting as IV for each assignment and the date by which the assignment needs to be verified.
- Setting an approach to sampling assessor decisions through internal verification that covers all assignments, assessors and a range of students.
- How to manage the assessment and verification of students' work, so that they can be given formal decisions promptly.

- How resubmission opportunities can be scheduled.

The Programme Leader will also maintain records of assessment undertaken. The key records are:

- Verification of assignment briefs
- Student authentication declarations
- Assessor decisions on assignments, with feedback given to students
- Verification of assessment decisions.

Examples of records and further information are available in the Pearson Quality Assurance Handbook available in the support section of our website (<http://qualifications.pearson.com>).

6.5 Calculation of the final qualification grade

6.5.1 Conditions for the award

Conditions for the award of the HND

To achieve a Pearson BTEC Level 5 Higher National Diploma qualification a student must have:

- completed units equivalent to 120 credits at level 5
- achieved at least a pass in 105 credits at level 5
- completed units equivalent to 120 credits at level 4
- achieved at least a pass in 105 credits at level 4.

Conditions for the award of the HNC

To achieve a Pearson BTEC Level 4 Higher National Certificate qualification a student must have:

- completed units equivalent to 120 credits at level 4
- achieved at least a pass in 105 credits at level 4.

6.5.2 Compensation provisions

Compensation provisions for the HND

Students can still be awarded an HND if they have attempted but not achieved a Pass in one of the 15-credit units completed at level 4, and similarly if they have attempted but not achieved a Pass in one of the 15-credit units at level 5. However, they must complete and pass the remaining units for an HNC or HND as per the unit rules of combination of the required qualification.

Compensation provisions for the HNC

Students can still be awarded an HNC if they have attempted but not achieved a Pass in one of the 15-credit units completed, but have completed and passed the remaining units.

6.5.3 Calculation of the overall qualification grade

The calculation of the **overall qualification grade** is based on the student's performance in all units. Students are awarded a Pass, Merit or Distinction qualification grade, using the points gained through all 120 credits, at Level 4 for the HNC or Level 5 for the HND, based on unit achievement. The overall qualification grade is calculated in the same way for the HNC and for the HND.

All units in valid combination must have been attempted for each qualification. The conditions of award and the compensation provisions will apply as outlined above. All 120 credits count in calculating the grade (at each level, as applicable).

The overall qualification grade for the HND will be calculated based on student performance in Level 5 units only.

Units that have been attempted but not achieved, and subsequently granted compensation, will appear as 'Unclassified', i.e. a 'U' grade, on the student's Notification of Performance, that is issued with the student certificate.

Points per credit

Grade	Points
Pass	4
Merit	6
Distinction	8

Point boundaries

Grade	Point boundaries
Pass	420–599
Merit	600–839
Distinction	840 +

6.5.4 Modelled student outcomes

Pearson BTEC Level 4 Higher National Certificate

				STUDENT 1		STUDENT 2		STUDENT 3		STUDENT 4		STUDENT 5	
	Credits	Level	Grade point	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points
Core 1	15	4	4	P	60	P	60	P	60	D	120	D	120
Core 2	15	4	4	P	60	P	60	P	60	D	120	M	90
Core 3	15	4	4	P	60	P	60	P	60	D	120	M	90
Core 4	15	4	4	P	60	P	60	M	90	M	90	M	90
Core 5	15	4	6	M	90	P	60	M	90	M	90	M	90
Core 6	15	4	6	M	90	P	60	M	90	M	90	M	90
Opt 1	15	4	6	M	90	M	90	D	120	D	120	D	120
Opt 2	15	4	6	M	90	M	90	D	120	D	120	D	120
TOTAL	120				600		540		690		870		810
GRADE					M		P		M		D		M

Pearson BTEC Level 5 Higher National Diploma

				STUDENT 1		STUDENT 2		STUDENT 3		STUDENT 4		STUDENT 5	
	Credits	Level	Grade point	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points	Grade	Unit points
Core 1	15	4	0	P	0	P	0	P	0	D	0	P	0
Core 2	15	4	0	P	0	P	0	P	0	D	0	M	0
Core 3	15	4	0	P	0	P	0	P	0	D	0	M	0
Core 4	15	4	0	P	0	P	0	M	0	M	0	M	0
Core 5	15	4	0	M	0	P	0	M	0	M	0	P	0
Core 6	15	4	0	M	0	P	0	M	0	D	0	U	0
Opt 1	15	4	0	M	0	P	0	D	0	D	0	D	0
Opt 2	15	4	0	M	0	P	0	D	0	D	0	D	0
Core 7	30	5	6	M	180	M	180	M	180	P	120	D	240
Core 8	15	5	6	M	90	M	90	M	90	P	60	D	120
Opt 3	15	5	6	M	90	M	90	D	120	P	60	D	120
Opt 4	15	5	6	M	90	P	60	D	120	P	60	D	120
Opt 5	15	5	6	M	90	P	60	D	120	M	90	M	90
Opt 6	15	5	6	M	90	P	60	M	90	M	90	P	60
Opt 7	15	5	6	M	90	P	60	M	90	M	90	M	90
TOTAL	240				720		600		810		570		840
GRADE					M		M		M		P		D

7 Quality assurance

Pearson's quality assurance system for all Pearson BTEC Higher National programmes is benchmarked to Level 4 and Level 5 on the Quality Assurance Agency (QAA) Framework for Higher Education Qualifications (FHEQ). This will ensure that centres have effective quality assurance processes to review programme delivery. It will also ensure that the outcomes of assessment are to national standards.

The quality assurance process for centres offering Pearson BTEC Higher National programmes comprise five key components:

- 1 The approval process
- 2 Monitoring of internal centre systems
- 3 Independent assessment review
- 4 Annual programme monitoring report
- 5 Annual student survey.

7.1 The approval process

Centres new to the delivery of Pearson programmes will be required to seek approval initially through the existing centre approval process and then through the programme approval process. Programme approval for new centres can be considered in one of two ways:

- Desk-based approval review
- Review and approval visit to the centre.

Prior to approval being given, centres will be required to submit evidence to demonstrate that they:

- Have the human and physical resources required for effective delivery and assessment.
- Understand the implications for independent assessment and agree to abide by these.
- Have a robust internal assessment system supported by 'fit for purpose' assessment documentation.
- Have a system to internally verify assessment decisions, to ensure standardised assessment decisions are made across all assessors and sites.

Applications for approval must be supported by the head of the centre (Principal or Chief Executive, etc.) and include a declaration that the centre will operate the programmes strictly, as approved and in line with Pearson requirements.

Centres seeking to renew their programme approval upon expiry of their current approval period may be eligible for the Automatic Approval process, subject to the centre meeting the eligibility criteria set out by Pearson.

Regardless of the type of centre, Pearson reserves the right to withdraw either qualification or centre approval when it deems there is an irreversible breakdown in the centre's ability either to quality assure its programme delivery or its assessment standards.

7.2 Monitoring of internal centre systems

Centres will be required to demonstrate ongoing fulfilment of the centre approval criteria over time and across all Higher National programmes. The process that assures this is external examination, which is undertaken by External Examiners EEs. Centres will be given the opportunity to present evidence of the ongoing suitability and deployment of their systems to carry out the required functions. This includes the consistent application of policies affecting student registrations, appeals, effective internal examination and standardisation processes. Where appropriate, centres may present evidence of their operation within a recognised code of practice, such as that of the QAA for Higher Education. Pearson reserves the right to confirm independently that these arrangements are operating to Pearson's standards.

Pearson will affirm, or not, the ongoing effectiveness of such systems. Where system failures are identified, sanctions (appropriate to the nature of the problem) will be applied, in order to assist the centre in correcting the problem.

7.3 Independent assessment review

The internal assessment outcomes reached for all Pearson BTEC Higher National programmes benchmarked to Level 4 and Level 5 of the QAA's FHEQ are subject to a visit from a Pearson appointed External Examiner EE. The outcomes of this process will be:

- To confirm that internal assessment is to national standards and allow certification, **or**
- To make recommendations to improve the quality of assessment outcomes before certification is released, **or**
- To make recommendations about the centre's ability to continue to be approved for the Pearson BTEC Higher National qualifications in question.

7.4 Annual Programme Monitoring Report (APMR)

The APMR is a written annual review form that provides opportunity for centres to analyse and reflect on the most recent teaching year. By working in collaboration with centres, the information can be used by Pearson to further enhance the quality assurance of the Pearson BTEC Higher National programmes.

7.5 Annual student survey

Pearson will conduct an annual survey of Pearson BTEC Higher National students. The purpose of the survey is to enable Pearson to evaluate the student experience as part of the quality assurance process, by engaging with students studying on these programmes.

7.6 Centre and qualification approval

As part of the approval process, your centre must make sure that the resource requirements listed below are in place before offering the qualification.

Centres must have appropriate physical resources (for example equipment, IT, learning materials, teaching rooms) to support the delivery and assessment of the qualifications.

- Staff involved in the assessment process must have relevant expertise and/or occupational experience.
- There must be systems in place to ensure continuing professional development for staff delivering the qualification.
- Centres must have in place appropriate health and safety policies relating to the use of equipment by staff and students.
- Centres must deliver the qualification in accordance with current equality legislation.
- Centres should refer to the individual unit descriptors to check for any specific resources required.

7.7 Continuing quality assurance and standards verification

We produce annually the latest version of the **Pearson Quality Handbook**. It contains detailed guidance on the quality processes required to underpin robust assessment and internal verification.

The key principles of quality assurance are that:

- A centre delivering Pearson BTEC Higher National programmes must be an approved centre, and must have approval for the programmes or groups of programmes that it is delivering.
- The centre agrees, as part of gaining approval, to abide by specific terms and conditions around the effective delivery and quality assurance of assessment; it must abide by these conditions throughout the period of delivery.

- Pearson makes available to approved centres a range of materials and opportunities through the assessment checking service. This is intended to exemplify the processes required for effective assessment and provide examples of effective standards. Approved centres must use the materials and services to ensure that all staff delivering BTEC qualifications keep up to date with the guidance on assessment.
- An approved centre must follow agreed protocols for standardisation of assessors and verifiers, for the planning, monitoring and recording of assessment processes, and for dealing with special circumstances, appeals and malpractice.

The approach of quality-assured assessment is through a partnership between an approved centre and Pearson. We will make sure that each centre follows best practice and employs appropriate technology to support quality-assurance processes where practicable. We work to support centres and seek to make sure that our quality-assurance processes do not place undue bureaucratic processes on centres. We monitor and support centres in the effective operation of assessment and quality assurance.

The methods we use to do this for Pearson BTEC Higher Nationals include:

- Making sure that all centres complete appropriate declarations at the time of approval
- Undertaking approval visits to centres
- Making sure that centres have effective teams of assessors and verifiers who are trained to undertake assessment
- Assessment sampling and verification through requested samples of assessments, completed assessed student work and associated documentation
- An overarching review and assessment of a centre's strategy for assessing and quality-assuring its BTEC programmes.

An approved centre must make certification claims only when authorised by us and strictly in accordance with requirements for reporting. Centres that do not fully address and maintain rigorous approaches to quality assurance cannot seek certification for individual programmes or for all Pearson BTEC Higher National qualifications.

Centres that do not comply with remedial action plans may have their approval to deliver qualifications removed.

8 Recognition of Prior Learning and attainment

Recognition of Prior Learning (RPL) is a method of assessment (leading to the award of credit) that considers whether students can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess, and so do not need to develop through a course of learning.

Pearson encourages centres to recognise students' previous achievements and experiences whether at work, home or at leisure, as well as in the classroom. RPL provides a route for the recognition of the achievements resulting from continuous learning. RPL enables recognition of achievement from a range of activities using any valid assessment methodology. Provided that the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification. Evidence of learning must be valid and reliable.

For full guidance on RPL please refer to the *Recognition of Prior Learning* policy document available in the support section of our website (<https://qualifications.pearson.com>).

QCF Pearson BTEC Level 4 Higher National Certificate in Computing unit content mapped to the Level 4 units available in the Pearson BTEC Higher National Computing programmes (RQF) in *Appendix 9* in this programme specification.

9 Equality and diversity

Equality and fairness are central to our work. The design of these qualifications embeds consideration of equality and diversity as set out in the qualification regulators' General Conditions of Recognition. Promoting equality and diversity involves treating everyone with equal dignity and worth, while also raising aspirations and supporting achievement for people with diverse requirements, entitlements and backgrounds. An inclusive environment for learning anticipates the varied requirements of students, and aims to ensure that all students have equal access to educational opportunities. Equality of opportunity involves enabling access for people who have differing individual requirements as well as eliminating arbitrary and unnecessary barriers to learning. In addition, students with and without disabilities are offered learning opportunities that are equally accessible to them, by means of inclusive qualification design.

Pearson's equality policy requires all students to have equal opportunity to access our qualifications and assessments. It also requires our qualifications to be designed and awarded in a way that is fair to every student. We are committed to making sure that:

- Students with a protected characteristic (as defined in legislation) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic.
- All students achieve the recognition they deserve from undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Pearson's policy regarding access to its qualifications is that:

- They should be available to everyone who is capable of reaching the required standards
- They should be free from any barriers that restrict access and progression
- There should be equal opportunities for all those wishing to access the qualifications.

Centres are required to recruit students to Higher National qualifications with integrity. This will include ensuring that applicants have appropriate information and advice about the qualifications, and that the qualification will meet their needs. Centres will need to review the entry profile of qualifications and/or experience held by applicants, considering whether this profile shows an ability to progress to a higher level qualification. Centres should take appropriate steps to assess each applicant's potential and make a professional judgement about their ability to successfully complete the programme of study and achieve the qualification. This assessment will need to take account of the support available to the student within the centre during their programme of study and any specific support that might be necessary to allow the student to access the assessment for the qualification. Centres should consult our policy documents on students with particular requirements.

Access to qualifications for students with disabilities or specific needs

Students taking a qualification may be assessed in a recognised regional sign language where it is permitted for the purpose of reasonable adjustments. Further information on access arrangements can be found in the Joint Council for Qualifications (JCQ) document Access Arrangements, Reasonable Adjustments and Special Consideration for General and Vocational Qualifications. Details on how to make adjustments for students with protected characteristics are given in the document *Pearson Supplementary Guidance for Reasonable Adjustment and Special Consideration in Vocational Internally Assessed Units*. See the support section our website for both documents (<http://qualifications.pearson.com/>).

10 Pearson BTEC Higher Nationals Computing Units

See additional document
'HND_L45_Comp_RQF Units_Iss6 (2021-22)'
for all the unit descriptors

11 Appendices

Appendix 1: Professional Body Memberships

Qualification	Membership/Specialist Group
Higher National Certificate in Computing	Student Membership
Higher National Diploma in Computing	Student Membership Associate Membership (on completion) Business Information Systems Specialist Group
Higher National Diploma in Computing (Network Engineering)	Student Membership Associate Membership (on completion) Distributed and Scalable Computing Specialist Group
Higher National Diploma in Computing (Software Engineering)	Student Membership Associate Membership (on completion) Advanced Programming Specialist Group Open Source Specialist Group Software Testing Specialist Group
Higher National Diploma in Computing (Systems Data & Analysis)	Student Membership Associate Membership (on completion) Data Management Specialist Group Information Risk Management and Assurance Specialist Group
Higher National Diploma in Computing (Security)	Student Membership Associate Membership (on completion) Cybercrime Forensics Specialist Group Information Security Specialist Group

Qualification	Membership/Specialist Group
Higher National Diploma in Computing (Applications Development)	Student Membership Associate Membership (on completion)
Higher National Diploma in Computing (All Pathways)	Project Management Specialist Group Quality Specialist Group Requirements engineering Specialist Group

Appendix 2: Vendor Accredited Certifications

[illegible]

27	Transport Network Design			X	X	X										X			
28	Cloud Computing					X					X				X				
29	Network Security		X	X	X	X				X						X			
30	Cryptography		X							X									
31	Forensics		X							X									
39	Network Management			X		X			X							X			
40	Client/Server Computing System			X			X	X											
41	Database Management Systems																	X	X
49	Systems Integration						X							X					
50	Operating Systems							X											

**Majority coverage - refer to CCNAv7 ENSA course guide for full content coverage under 'Network Security Concepts'*

***All general knowledge content covered, vendor specific hardware and software requirements not covered*

Appendix 3: SFIA Skill Levels

SFIA LEVEL 3 SKILLS

Skill	Description	
Information security	The selection, design, justification, implementation and operation of controls and management strategies to maintain the security, confidentiality, integrity, availability, accountability and relevant compliance of information systems with legislation, regulation and relevant standards.	Communicates information security risks and issues to business managers and others. Performs basic risk assessments for small information systems. Contributes to vulnerability assessments. Applies and maintains specific security controls as required by organisational policy and local risk assessments. Takes action to respond to security breaches in line with security policy and records the incidents and action taken.
Analytics	The validation and analysis of significant volumes of data, including the ability to discover and quantify patterns and trends in numbers, symbols, text, sound and image. Relevant techniques may include statistical and data mining algorithms and machine learning methods such as rule induction, artificial neural networks, genetic algorithms and automated indexing systems.	Undertakes analytical activities and delivers analysis outputs, in accordance with customer needs and conforming to agreed standards.

Skill	Description	
Information content publishing	The evaluation and application of different publishing methods and options, recognising key features, including open source and proprietary options. The management and tuning of the processes that collect, assemble and publish information, including in unstructured and semi-structured forms, for delivery to the user at the point at which it is needed. The management of copyright, data protection and other legal issues associated with publishing and re-use of published information and data.	Specifies and creates content management processes to meet the needs of users. Selects appropriate platforms for publishing, applying the concept of customer journey. Uses content publishing systems and publishing content across different channels, including mobile and social media. Takes account of the implications of copyright, data protection and other legal issues associated with publishing. Contributes to achievement of search engine optimisation.
Research	The advancement of knowledge by data gathering, innovation, experimentation, evaluation and dissemination, carried out in pursuit of a predetermined set of research goals.	Within given research goals, builds on and refines appropriate outline ideas for research, i.e. evaluation, development, demonstration and implementation. Uses available resources to gain an up-to-date knowledge of any relevant field. Reports on work carried out and may contribute sections of material of publication quality.
Data management	The management of practices and processes to ensure the security, integrity, safety and availability of all forms of data and data structures that make up the organisation's information. The management of data and information in all its forms and the analysis of information structure (including logical analysis of taxonomies, data and metadata). The development of innovative ways of managing the information assets of the organisation.	Applies ethical and robust techniques in the transformation of data from one format/medium to another, in line with organisational policies and procedures and being sensitive to risks around the use of information.

Skill	Description	
Portfolio, programme and project support	The provision of support and guidance on portfolio, programme and project management processes, procedures, tools and techniques. Support includes definition of portfolios, programmes, and projects; advice on the development, production and maintenance of business cases; time, resource, cost and exception plans, and the use of related software tools. Tracking and reporting of programme/project progress and performance are also covered, as is the capability to facilitate all aspects of portfolio/ programme/project meetings, workshops and documentation.	Uses recommended portfolio, programme and project control solutions for planning, scheduling and tracking. Sets up project files, compiles and distributes reports. Provides administrative services to project boards, project assurance teams and quality review meetings. Provides guidance on project management software, procedures, processes, tools and techniques.
Business analysis	The methodical investigation, analysis, review and documentation of all or part of a business in terms of business functions and processes, the information used and the data on which the information is based. The definition of requirements for improving processes and systems, reducing their costs, enhancing their sustainability, and the quantification of potential business benefits. The collaborative creation and iteration of viable specifications and acceptance criteria in preparation for the deployment of information and communication systems.	Investigates operational needs and problems, and opportunities, contributing to the recommendation of improvements in automated and non-automated components of new or changed processes and organisation. Assists in defining acceptance tests for these recommendations.

Skill	Description	
Requirements definition and management	The definition and management of the business goals and scope of change initiatives. The specification of business requirements to a level that enables effective delivery of agreed changes.	Defines scope and business priorities for small-scale changes and may assist in larger scale scoping exercises. Elicits and discovers requirements from operational management and other stakeholders. Selects appropriate techniques for the elicitation of detailed requirements taking into account the nature of the required changes, established practice and the characteristics and culture of those providing the requirements. Specifies and documents business requirements as directed, ensuring traceability back to source. Analyses them for adherence to business objectives and for consistency, challenging positively as appropriate. Works with stakeholders to prioritise requirements.
Business modelling	The production of abstract or distilled representations of real world, business or gaming situations in traditional or trans-media applications, to aid the communication and understanding of existing, conceptual or proposed scenarios. Predominantly focused around the representation of processes, roles, data, organisation and time. Models may be used to represent a subject at varying levels of detail and decomposition.	Conversant with techniques covering full range of modelling situations. Models current and desired scenarios as directed. Selects appropriate modelling techniques for meeting assigned objectives. Gains agreement from subject matter experts to models produced. Reviews resulting models with stakeholders and gains resolution to resultant issues.

Skill	Description	
Data analysis	The investigation, evaluation, interpretation and classification of data, in order to define and clarify information structures which describe the relationships between real world entities. Such structures facilitate the development of software systems, links between systems or retrieval activities.	Applies data analysis, data modelling, and quality assurance techniques, based upon a detailed understanding of business processes, to establish, modify or maintain data structures and associated components (entity descriptions, relationship descriptions, attribute definitions). Advises database designers and other application development team members on the details of data structures and associated components.
Systems design	The specification and design of information systems to meet defined business needs in any public or private context, including commercial, industrial, scientific, gaming and entertainment. The identification of concepts and their translation into implementable design. The design or selection of components. The retention of compatibility with enterprise and solution architectures, and the adherence to corporate standards within constraints of cost, security and sustainability.	Specifies user/system interfaces, and translates logical designs into physical designs taking account of target environment, performance security requirements and existing systems. Produces detailed designs and documents all work using required standards, methods and tools, including prototyping tools where appropriate.
Database design	The specification, design and maintenance of mechanisms for storage and access to both structured and unstructured information, in support of business information needs.	Develops specialist knowledge of database concepts, object and data modelling techniques and design principles. Translates object and data models into appropriate database schemas within design constraints. Interprets installation standards to meet project needs and produces database components as required. Evaluates potential solutions, demonstrating, installing and commissioning selected products.

Skill	Description	
Programming/software development	The design, creation, testing and documenting of new and amended software components from supplied specifications in accordance with agreed development and security standards and processes.	Designs, codes, tests, corrects, and documents moderately complex programs and scripts from agreed specifications and subsequent iterations, using agreed standards and tools. Collaborates in reviews of specifications, with others as appropriate.
Safety engineering	The application of appropriate methods to assure safety during all lifecycle phases of safety-related systems developments, including maintenance and re-use. These include safety hazard and risk analysis, safety requirements specification, safety-related system architectural design, formal method design, safety validation and verification, and safety case preparation.	Assists with the collection of safety assurance evidence, undertaking all work in accordance with agreed safety, technical and quality standards, using appropriate methods and tools. Documents the results of hazard and risk analysis activities.
Information content authoring	The management and application of the principles and practices of designing, creation and presentation of textual information, supported where necessary by graphical content for interactive and digital uses. The adoption of workflow principles and definition of user roles and engagement and training of content providers. This material may be delivered electronically (for example, as collections of web pages) or otherwise. This skill includes managing the quality assurance and authoring processes for the material being produced.	Liaises with clients/users to clarify details of requirements. Designs, creates and tests moderately complex subject matter, using easily understood language. Designs content for search engine optimisation, making informed decisions about the best way to present information to users. Ensures that content is accurate, relevant and current and takes into account user needs.

Skill	Description	
Testing	<p>The planning, design, management, execution and reporting of tests, using appropriate testing tools and techniques and conforming to agreed process standards and industry specific regulations. The purpose of testing is to ensure that new and amended systems, configurations, packages, or services, together with any interfaces, perform as specified (including security requirements), and that the risks associated with deployment are adequately understood and documented. Testing includes the process of engineering, using and maintaining testware (test cases, test scripts, test reports, test plans, etc.) to measure and improve the quality of the software being tested.</p>	<p>Reviews requirements and specifications, and defines test conditions. Designs test cases and test scripts under own direction, mapping back to pre-determined criteria, recording and reporting outcomes. Analyses and reports test activities and results. Identifies and reports issues and risks associated with own work.</p>
User experience analysis	<p>The identification, analysis, clarification and communication of the context of use in which applications will operate, and of the goals of products, systems or services. Analysis and prioritisation of stakeholders' 'user experience' needs and definition of required system behaviour and performance. Resolution of potential conflicts between user requirements and determination of usability objectives</p>	<p>Identifies and engages with users/ stakeholders, defines relevant characteristics (e.g. 'personas') and describes users goals and tasks (e.g. as 'user stories'). Describes the environment within which the system will be used. Identifies and describes requirements of users with special needs (e.g. resulting from physical disabilities).</p>

Skill	Description	
User experience design	The iterative development of user tasks, interaction and interfaces to meet user requirements, considering the whole user experience. Refinement of design solutions in response to user-centred evaluation and feedback and communication of the design to those responsible for implementation.	Develops visual user experiences across digital assets (web and other digital channels). Works as part of a team to translate digital concepts into consistent graphical representations under creative direction. Supports the capture of business requirements from clients and users, and translates requirements into design briefs. Produces accessible user experiences, prototypes and final assets. Defines cost effective and efficient digital solutions, proactively resolves technical problems and ensures that technical solutions continue to meet business requirements.
User experience evaluation	Evaluation of systems, products or services, to assure that the stakeholder and organisational requirements have been met, required practice has been followed, and systems in use continue to meet organisational and user needs. Iterative assessment (from early prototypes to final live implementation) of effectiveness, efficiency, user satisfaction, health and safety, and accessibility to measure or improve the usability of new or existing processes, with the intention of achieving optimum levels of product or service usability.	Evaluate prototypes to obtain user feedback on requirements of developing systems. Tests the usability of component systems, and alternative designs, administering formative and summative usability tests, logging and analysing data. Check systems for adherence to applicable human science knowledge, style guides, guidelines, standards and legislation. Evaluates the usability of existing or competitor systems to provide benchmark values and as input to design.

Skill	Description	
Systems integration	The incremental and logical integration and testing of components and/or subsystems and their interfaces in order to create operational services.	Defines the integration build and produces a build definition for generation of the software. Accepts software modules from software developers, and produces software builds for loading onto the target hardware from software source code. Configures the hardware environment, produces integration test specifications, conducts tests and records the details of any failures. Carries out and reports fault diagnosis relating to moderately complex problems.
Porting/software configuration	The configuration of software products into new or existing software environments/platforms.	Assists in the configuration of software and equipment and the systems testing of platform-specific versions of one or more software products. Documents faults, implements resolutions and retests to agreed standards.
Systems installation/ decommissioning	The installation, testing, implementation or decommissioning and removal of cabling, wiring, equipment, hardware and associated software, following plans and instructions and in accordance with agreed standards. The testing of hardware and software components, resolution of malfunctions, and recording of results. The reporting of details of hardware and software installed so that configuration management records can be updated.	Installs or removes hardware and/or software, using supplied installation instructions and tools including, where appropriate, handover to the client. Conducts tests, corrects malfunctions, and documents results in accordance with agreed procedures. Reports details of all hardware/ software items that have been installed and removed so that configuration management records can be updated. Provides assistance to users in a professional manner following agreed procedures for further help or escalation.

Skill	Description	
		Reviews change requests. Maintains accurate records of user requests, contact details and outcomes. Contributes to the development of installation procedures and standards.
Service level management	The planning, implementation, control, review and audit of service provision, to meet customer business requirements. This includes negotiation, implementation and monitoring of service level agreements, and the ongoing management of operational facilities to provide the agreed levels of service, seeking continually and proactively to improve service delivery and sustainability targets.	Monitors service delivery performance metrics and liaises with managers and customers to ensure that service level agreements are not breached without the stakeholders being given the opportunity of planning for a deterioration in service.
Configuration management	The lifecycle planning, control and management of the assets of an organisation (such as documentation, software and service assets, including information relating to those assets and their relationships. This involves identification, classification and specification of all configuration items (CIs) and the interfaces to other processes and data. Required information relates to storage, access, service relationships, versions, problem reporting and change control of CIs. The application of status accounting and auditing, often in line with acknowledged external criteria such as ISO 9000, ISO/IEC 20000, ISO/IEC 27000 and security throughout all stages of the CI lifecycle, including the early stages of system development.	Applies tools, techniques and processes to track, log and correct information related to CIs, ensuring protection of assets and components from unauthorised change, diversion and inappropriate use.

Skill	Description	
Change management	The management of change to the service infrastructure including service assets, configuration items and associated documentation. Change management uses requests for change (RFC) for standard or emergency changes, and changes due to incidents or problems to provide effective control and reduction of risk to the availability, performance, security and compliance of the business services impacted by the change.	Develops, documents and implements changes based on requests for change. Applies change control procedures.
Release and deployment	The management of the processes, systems and functions to package, build, test and deploy changes and updates (which are bounded as 'releases') into a live environment, establishing or continuing the specified Service, to enable controlled and effective handover to Operations and the user community.	Uses the tools and techniques for specific areas of release and deployment activities. Administers the recording of activities, logging of results and documents technical activity undertaken. May carry out early life support activities such as providing support advice to initial users.
System software	The provision of specialist expertise to facilitate and execute the installation and maintenance of system software such as operating systems, data management products, office automation products and other utility software.	Uses system management software and tools to collect agreed performance statistics. Carries out agreed system software maintenance tasks.
Security administration	The provision of operational security management and administrative services. Typically includes the authorisation and monitoring of access to IT facilities or infrastructure, the investigation of unauthorised access and compliance with relevant legislation.	Investigates minor security breaches in accordance with established procedures. Assists users in defining their access rights and privileges. Performs non-standard security administration tasks and resolves security administration issues.

Skill	Description	
Application support	<p>The provision of application maintenance and support services, either directly to users of the systems or to service delivery functions. Support typically includes investigation and resolution of issues and may also include performance monitoring. Issues may be resolved by providing advice or training to users, by devising corrections (permanent or temporary) for faults, making general or site-specific modifications, updating documentation, manipulating data, or defining enhancements support often involves close collaboration with the system's developers and/or with colleagues specialising in different areas, such as database administration or network support.</p>	<p>Identifies and resolves issues with applications, following agreed procedures. Uses application management software and tools to collect agreed performance statistics. Carries out agreed applications maintenance tasks.</p>
IT Infrastructure	<p>The operation and control of the IT infrastructure (typically hardware, software, data stored on various media, and all equipment within wide and local area networks) required to deliver and support IT services and products to meet the needs of a business. Includes preparation for new or changed services, operation of the change process, the maintenance of regulatory, legal and professional standards, the building and management of systems and components in virtualised computing environments and the monitoring of performance of systems and services in relation to their contribution to business performance, their security and their sustainability.</p>	<p>Carries out agreed operational procedures, including network configuration, installation and maintenance. Uses network management tools to collect and report on network load and performance statistics. Contributes to the implementation of maintenance and installation work. Uses standard procedures and tools to carry out defined system backups, restoring data where necessary. Identifies operational problems and contributes to their resolution.</p>

Skill	Description	
Database administration	The installation, configuration, upgrade, administration, monitoring and maintenance of databases.	Uses database management system software and tools to collect agreed performance statistics. Carries out agreed database maintenance and administration tasks.
Storage management	The planning, implementation, configuration and tuning of storage hardware and software covering online, offline, remote and offsite data storage (backup, archiving and recovery) and ensuring compliance with regulatory and security requirements.	Performs regular high-performance, scalable backups and restores on a schedule and tracks offsite storage. Carries out documented configuration for allocation of storage, installation and maintenance of secure storage systems as per the agreed operational procedure (e.g. using replication software to allow resilience). Identifies operational problems and contributes to their resolution (e.g. monitoring SAN for disk failures and replacing). Uses standard management and reporting tools to collect and report on storage utilisation, performance and backup statistics.
Network support	The provision of network maintenance and support services. Support may be provided both to users of the systems and to service delivery functions. Support typically takes the form of investigating and resolving problems and providing information about the systems. It may also include monitoring their performance. Problems may be resolved by providing advice or training to users about the network's functionality, correct operation or constraints, by devising work-arounds, correcting faults, or making general or site-specific modifications.	Identifies and resolves network problems following agreed procedures. Uses network management software and tools to collect agreed performance statistics. Carries out agreed network maintenance tasks.

Skill	Description	
Problem management	The resolution (both reactive and proactive) of problems throughout the information system lifecycle, including classification, prioritisation and initiation of action, documentation of root causes and implementation of remedies to prevent future incidents.	Investigates problems in systems, processes and services. Assists with the implementation of agreed remedies and preventative measures.
Incident management	The processing and coordination of appropriate and timely responses to incident reports, including channelling requests for help to appropriate functions for resolution, monitoring resolution activity, and keeping clients apprised of progress towards service restoration.	Following agreed procedures, identifies, registers and categorises incidents. Gathers information to enable incident resolution and promptly allocates incidents as appropriate. Maintains records and advises relevant persons of actions taken.
Facilities management	The planning, control and management of all the facilities which, collectively, make up the IT estate. This involves provision and management of the physical environment, including space and power allocation, and environmental monitoring to provide statistics on energy usage. Encompasses physical access control, and adherence to all mandatory policies and regulations concerning health and safety at work.	Monitors compliance against agreed processes and investigates, assesses and resolves incidents of non-compliance, escalating where necessary. Grants users required physical accesses and monitors and reports on overall access control.
Learning and development management	The provision of learning and development processes (including learning management systems) in order to develop the professional, business and/or technical skills required by the organisation.	Contributes to the maintenance and updates of training records and training catalogue.

Skill	Description	
Learning assessment and evaluation	The assessment of knowledge, skills and behaviour by any means whether formal or informal against capability and qualification frameworks such as SFIA. The evaluation of learning or education programmes against defined outcomes.	Performs routine assessments of knowledge and experience using specified methods and according to specified standards.
Learning delivery	The transfer of business and/or technical skills and knowledge and the promotion of professional attitudes in order to facilitate learning and development. Uses a range of techniques, resources and media (which might include eLearning, on-line virtual environments, self-assessment, peer-assisted learning, simulation, and other current methods).	Delivers learning activities to a variety of audiences.
Quality assurance	The process of ensuring that the agreed quality standards within an organisation are adhered to and that best practice is promulgated throughout the organisation.	Uses appropriate methods and tools in the development, maintenance, control and distribution of quality and environmental standards. Makes technical changes to quality and environmental standards according to documented procedures. Distributes new and revised standards.
Quality standards	The development, maintenance, control and distribution of quality standards.	Controls, updates and distributes new and revised quality standards.
Conformance review	The independent assessment of the conformity of any activity, process, deliverable, product or service to the criteria of specified standards, best practice, or other documented requirements. May relate to, for example, asset management, Network Security tools, firewalls and internet security, sustainability, real-time systems, application design and specific certifications.	Collects and collates evidence as part of a formally conducted and planned review of activities, processes, products or services. Examines records as part of specified testing strategies for evidence of compliance with management directives, or the identification of abnormal occurrences.

Skill	Description	
Sourcing	<p>The provision of policy, internal standards and advice on the procurement or commissioning of externally supplied and internally developed products and services. The provision of commercial governance, conformance to legislation and assurance of information security. The implementation of compliant procurement processes, taking full account of the issues and imperatives of both the commissioning and supplier sides. The identification and management of suppliers to ensure successful delivery of products and services required by the business.</p>	<p>Prepares pre-qualification questionnaires and tender invitations in response to business cases. Recognises the difference between open source and proprietary systems options. Produces detailed evaluation criteria for more complex tenders and assists in evaluation of tenders. Acts as the routine contact point between organisation and supplier. Collects and reports on supplier performance data.</p>
Customer service support	<p>The management and operation of one or more customer service or service desk functions. Acting as a point of contact to support service users and customers reporting issues, requesting information, access, or other services.</p>	<p>Acts as the routine contact point, receiving and handling requests for support. Responds to a broad range of service requests for support by providing information to fulfil requests or enable resolution. Provides first line investigation and diagnosis and promptly allocates unresolved issues as appropriate. Assists with the development standards, and applies these to track, monitor, report, resolve or escalate issues. Contributes to creation of support documentation.</p>

Skill	Description	
Sales support	The provision of technical advice and assistance to the sales force, sales agents, reseller/distributor staff and existing or prospective customers, either in support of customer development or sales activity or in fulfilment of sales obligations.	Provides customer service, including technical advice and guidance on all matters bearing on the successful use of complex products and services. Helps customers to clarify their requirements; documents the conclusions reached, and contributes to preparing and supporting bids and sales proposals.
Product management	The active management of a product or service throughout its lifecycle (inception through to retirement) in order to address a market opportunity/customer need and generate the greatest possible value for the business.	Carries out research and performance monitoring activities for specified products. Develops marketing collateral content and evaluates results and feedback from marketing campaigns.

SFIA LEVEL 4 SKILLS

Skill	Description	
Information management	The overall governance of how all types of information, structured and unstructured, whether produced internally or externally, are used to support decision-making, business processes and digital services. Encompasses development and promotion of the strategy and policies covering the design of information structures and taxonomies, the setting of policies for the sourcing and maintenance of the data content, and the development of policies, procedures, working practices and training to promote compliance with legislation regulating all aspects of holding, use and disclosure of data.	Understands and complies with relevant organisational policies and procedures, taking responsibility for assessing and managing risks around the use of information. Ensures that information is presented effectively. Ensures that effective controls are in place for internal delegation, audit and control and that the board receives timely reports and advice that will inform their decisions.
Information security	The selection, design, justification, implementation and operation of controls and management strategies to maintain the security, confidentiality, integrity, availability, accountability and relevant compliance of information systems with legislation, regulation and relevant standards.	Explains the purpose of and provides advice and guidance on the application and operation of elementary physical, procedural and technical security controls. Performs security risk, vulnerability assessments, and business impact analysis for medium complexity information systems. Investigates suspected attacks and manages security incidents. Uses forensics where appropriate.
Analytics	The validation and analysis of significant volumes of data, including the ability to discover and quantify patterns and trends in numbers, symbols, text, sound and image. Relevant techniques may include statistical and data mining algorithms and machine learning methods such as rule induction, artificial neural networks, genetic algorithms and automated indexing systems.	Applies a variety of analytical and visualisation techniques, in consultation with experts if appropriate, and with sensitivity to the limitations of the techniques.

Skill	Description	
Information content publishing	The evaluation and application of different publishing methods and options, recognising key features, including open source and proprietary options. The management and tuning of the processes that collect, assemble and publish information, including in unstructured and semi-structured forms, for delivery to the user at the point at which it is needed. The management of copyright, data protection and other legal issues associated with publishing and re-use of published information and data.	Defines and manages content management processes to meet the needs of users. Select appropriate channels through which content should be published. Uses appropriate tools and techniques to provide moderately complex interfaces to new or existing platforms and applications. Applies propriety guidelines. Identifies the implications of copyright, data protection and other legal issues associated with publishing. Applies search engine optimisation techniques, and facilitates ease of use in delivered digital services.
Technical specialism	The development and exploitation of expertise in any specific area of information or communications technology, technique, method, product or application area.	Maintains knowledge of specific specialisms, provides detailed advice regarding their application and executes specialised tasks. The specialism can be any area of information or communication technology, technique, method, product or application area.
Research	The advancement of knowledge by data gathering, innovation, experimentation, evaluation and dissemination, carried out in pursuit of a predetermined set of research goals.	Contributes to research goals and builds on and refines appropriate outline ideas for the evaluation, development, demonstration and implementation of research. Reports on work carried out and may contribute significant sections of material of publication quality. Contributes to research plans and identifies appropriate opportunities for publication and dissemination of research findings.

Skill	Description	
Financial management	The overall financial management, control and stewardship of the IT assets and resources used in the provision of IT services, including the identification of materials and energy costs, ensuring compliance with all governance, legal and regulatory requirements.	Monitors and maintains all required financial records for compliance and audit to all agreed requirements. Assists all other areas of IT with their financial tasks, especially in the areas of identification of process, service, project and component costs and the calculation and subsequent reduction of all IT service, project, component and process failures. Contributes to financial planning and budgeting. Collates required financial data and reports for analysis and to facilitate decision making.
Business risk management	The planning and implementation of organisation-wide processes and procedures for the management of risk to the success or integrity of the business, especially those arising from the use of information technology, reduction or non-availability of energy supply or inappropriate disposal of materials, hardware or data.	Investigates and reports on hazards and potential risk events within a specific function or business area.

Skill	Description	
Sustainability strategy	<p>The preparation of a sustainability strategy, taking into account any established corporate strategy, to be used as a basis for policies and planning, and covering both consumption and sources of supply of energy and materials. Evaluation and inclusion, as appropriate, of political, legislative, economic, social and technological factors. Identification of major external standards, practices or schemes to be adopted. Consultation with identified relevant parties, either internal or external. Obtaining agreement to the strategy and the commitment to act upon it.</p>	<p>Assesses and reports on how different tactical decisions affect organisational sustainability. Evaluates factors and risks (political, legislative, technological, economic, and social) that impact on operational processes and strategic direction.</p>
Emerging technology monitoring	<p>The identification of new and emerging hardware, software and communication technologies and products, services, methods and techniques and the assessment of their relevance and potential value as business enablers, improvements in cost/performance or sustainability. The promotion of emerging technology awareness among staff and business management.</p>	<p>Maintains awareness of opportunities provided by new technology to address challenges or to enable new ways of working. Within own sphere of influence, works to further organisational goals, by the study and use of emerging technologies and products. Contributes to briefings and presentations about their relevance and potential value to the organisation.</p>

Skill	Description	
Continuity management	The provision of service continuity planning and support. This includes the identification of information systems which support critical business processes, the assessment of risks to those systems' availability, integrity and confidentiality and the co-ordination of planning, designing, testing and maintenance procedures and contingency plans to address exposures and maintain agreed levels of continuity. This function should be performed as part of, or in close cooperation with, the function which plans business continuity for the whole organisation.	Provides input to the service continuity planning process and implements resulting plans.
Data management	The management of practices and processes to ensure the security, integrity, safety and availability of all forms of data and data structures that make up the organisation's information. The management of data and information in all its forms and the analysis of information structure (including logical analysis of taxonomies, data and metadata). The development of innovative ways of managing the information assets of the organisation.	Takes responsibility for the accessibility, retrievability and security of specific subsets of data. Assesses the integrity of data from multiple sources (including, for example, from sensors measurement systems). Provides advice on the transformation of data/information from one format/medium to another, where appropriate.
		Maintains and implements information handling procedures. Enables the availability, integrity and searchability of information through the application of formal data structures and protection measures. Manipulates specific data from information services, to satisfy local or specific information needs.

Skill	Description	
Methods and tools	Ensuring that appropriate methods and tools for the planning, development, testing, operation, management and maintenance of systems are adopted and used effectively throughout the organisation.	Provides expertise and support on use of methods and tools.
Project management	The management of projects, typically (but not exclusively) involving the development and implementation of business processes to meet identified business needs, acquiring and utilising the necessary resources and skills, within agreed parameters of cost, timescales, and quality.	Defines, documents and carries out small projects or sub-projects (typically less than six months, with limited budget, limited interdependency with other projects, and no significant strategic impact), alone or with a small team, actively participating in all phases. Identifies, assesses and manages risks to the success of the project. Agrees project approach with stakeholders, and prepares realistic plans (including quality, risk and communications plans) and tracks activities against the project schedule, managing stakeholder involvement as appropriate. Monitors costs, timescales and resources used, and takes action where these deviate from agreed tolerances. Ensures that own projects are formally closed and, where appropriate, subsequently reviewed, and that lessons learned are recorded.

Skill	Description	
Portfolio, programme and project support	<p>The provision of support and guidance on portfolio, programme and project management processes, procedures, tools and techniques. Support includes definition of portfolios, programmes, and projects; advice on the development, production and maintenance of business cases; time, resource, cost and exception plans, and the use of related software tools. Tracking and reporting of programme/project progress and performance are also covered, as is the capability to facilitate all aspects of portfolio/ programme/ project meetings, workshops and documentation.</p>	<p>Takes responsibility for the provision of support services to projects. Uses and recommends project control solutions for planning, scheduling and tracking projects. Sets up and provides detailed guidance on project management software, procedures, processes, tools and techniques. Supports programme or project control boards, project assurance teams and quality review meetings. Provides basic guidance on individual project proposals. May be involved in aspects of supporting a programme by providing a cross programme view on risk, change, quality, finance or configuration management.</p>
Business analysis	<p>The methodical investigation, analysis, review and documentation of all or part of a business in terms of business functions and processes, the information used and the data on which the information is based. The definition of requirements for improving processes and systems, reducing their costs, enhancing their sustainability, and the quantification of potential business benefits. The collaborative creation and iteration of viable specifications and acceptance criteria in preparation for the deployment of information and communication systems.</p>	<p>Investigates operational requirements, problems, and opportunities, seeking effective business solutions through improvements in automated and non-automated components of new or changed processes. Assists in the analysis of stakeholder objectives, and the underlying issues arising from investigations into business requirements and problems, and identifies options for consideration. Works iteratively with stakeholders, to identify potential benefits and available options for consideration, and in defining acceptance tests.</p>

Skill	Description	
Requirements definition and management	The definition and management of the business goals and scope of change initiatives. The specification of business requirements to a level that enables effective delivery of agreed changes.	Facilitates scoping and business priority-setting for change initiatives of medium size and complexity. Contributes to selection of the most appropriate means of representing business requirements in the context of a specific change initiative, ensuring traceability back to source. Discovers and analyses requirements for fitness for purpose as well as adherence to business objectives and consistency, challenging positively as appropriate. Obtains formal agreement by stakeholders and recipients to scope and requirements and establishes a base-line on which delivery of a solution can commence. Manages requests for and the application of changes to base-lined requirements. Identifies the impact on business requirements of interim (e.g. migration) scenarios as well as the required end position.
Business process testing	The planning, design, management, execution and reporting of business process tests and usability evaluations. The application of evaluation skills to the assessment of the ergonomics, usability and fitness for purpose of defined processes. This includes the synthesis of test tasks to be performed (from statement of user needs and user interface specification), the design of an evaluation programme, the selection of user samples, the analysis of performance, and inputting results to the development team.	Specifies and develops test scenarios to test that new/updated processes deliver improved ways of working for the end user at the same time as delivering efficiencies and planned business benefits. Records and analyses test results, and reports any unexpected or unsatisfactory outcomes. Uses test plans and outcomes to specify user instructions.

Skill	Description	
Business modelling	<p>The production of abstract or distilled representations of real world, business or gaming situations in traditional or trans-media applications, to aid the communication and understanding of existing, conceptual or proposed scenarios. Predominantly focused around the representation of processes, roles, data, organisation and time. Models may be used to represent a subject at varying levels of detail and decomposition.</p>	<p>Conducts advanced modelling activities for significant change programmes and across multiple business functions. Has an in-depth knowledge of organisation-standard techniques. Plans own modelling activities, selecting appropriate techniques and the correct level of detail for meeting assigned objectives. May contribute to discussions about the choice of the modelling approach to be used. Obtains input from and communicates modelling results to senior managers for agreement.</p>
Sustainability assessment	<p>The evaluation of the sustainability of operational or planned services, devices and day-to-day operations such as travel. The establishment of a model or scheme to track changes in consumption over time and to generate feedback to enable improvements in energy or resource efficiency. The identification of areas requiring attention, and the initiation of actions to change or control the procurement of energy or other resources, so as to improve sustainability.</p>	<p>Assesses, records and reports on utilisation of energy and other resources, showing expertise in a given area such as a class of computing devices, or business travel. Provides advice on the improvement of sustainability in that area of expertise.</p>

Skill	Description	
Data analysis	The investigation, evaluation, interpretation and classification of data, in order to define and clarify information structures which describe the relationships between real world entities. Such structures facilitate the development of software systems, links between systems or retrieval activities.	Investigates corporate data requirements, and applies data analysis, data modelling and quality assurance techniques, to establish, modify or maintain data structures and their associated components (entity descriptions, relationship descriptions, attribute definitions). Provides advice and guidance to database designers and others using the data structures and associated components.
Systems design	The specification and design of information systems to meet defined business needs in any public or private context, including commercial, industrial, scientific, gaming and entertainment. The identification of concepts and their translation into implementable design. The design or selection of components. The retention of compatibility with enterprise and solution architectures, and the adherence to corporate standards within constraints of cost, security and sustainability.	Recommends/Designs structures and tools for systems which meet business needs and takes into account target environment, performance security requirements and existing systems. Delivers technical visualisation of proposed applications for approval by customer and execution by system developers. Translates logical designs into physical designs, and produces detailed design documentation. Maps work to user specification and removes errors and deviations from specification to achieve user-friendly processes.

Skill	Description	
Database design	The specification, design and maintenance of mechanisms for storage and access to both structured and unstructured information, in support of business information needs.	Develops and maintains specialist knowledge of database concepts, object and data modelling techniques and design principles and a detailed knowledge of database architectures, software and facilities. Analyses data requirements to establish, modify or maintain object/data models. Evaluates potential solutions, demonstrating, installing and commissioning selected products.
Programming/software development	The design, creation, testing and documenting of new and amended software components from supplied specifications in accordance with agreed development and security standards and processes.	Designs, codes, tests, corrects and documents complex programs and scripts from agreed specifications, and subsequent iterations, using agreed standards and tools, to achieve a well-engineered result. Takes part in reviews of own work and leads reviews of colleagues' work.
Safety engineering	The application of appropriate methods to assure safety during all lifecycle phases of safety-related systems developments, including maintenance and re-use. These include safety hazard and risk analysis, safety requirements specification, safety-related system architectural design, formal method design, safety validation and verification, and safety case preparation.	Contributes to the identification, analysis and documentation of hazards, and to the capture, evaluation and specification of safety requirements. Analyses and documents safety validation results. Contributes to the development and maintenance of project safety assurance plans, and gathers safety assurance evidence for safety case preparation.

Skill	Description	
Sustainability engineering	The development and application of appropriate knowledge and methods to assure sustainability in all phases of the life cycle of energy- or materials-consuming systems and services, including maintenance and re-use. These include such things as energy supply risk analysis, specification of guidelines for sustainable procurement of assets and materials, energy efficiency and sustainability factors influencing system design, system design for sustainable operation and use, efficient coding design and adoption of re-use/sharing principles, achieving behaviour change to more sustainable ways of working, and the verification of energy and resource efficiency in operation.	Investigates and recommends components and subsystems that meet sustainability criteria and levels.

Skill	Description	
Information content authoring	<p>The management and application of the principles and practices of designing, creation and presentation of textual information, supported where necessary by graphical content for interactive and digital uses. The adoption of workflow principles and definition of user roles and engagement and training of content providers. This material may be delivered electronically (for example, as collections of web pages) or otherwise. This skill includes managing the quality assurance and authoring processes for the material being produced.</p>	<p>Engages with senior content owners, using objective evidence to determine the content needs of users. Controls, monitors and evaluates web content to ensure quality, consistency and accessibility of messages. Designs the content and appearance of complex information deliverables (e.g. web pages) in collaboration with clients/users. Moderates content and ensures it can be reused. Creates and tests complex, well-engineered deliverables to support simple, clear, fast services. Interprets analytics data to optimise content so that it meets user needs and is optimised for search engines. Reviews work of other content designers for consistency and accuracy, and takes responsibility for its publication. Understand the implications of publishing content and manages the risks of doing so.</p>
Testing	<p>The planning, design, management, execution and reporting of tests, using appropriate testing tools and techniques and conforming to agreed process standards and industry specific regulations. The purpose of testing is to ensure that new and amended systems, configurations, packages, or services, together with any interfaces, perform as specified (including security requirements), and that the risks associated with deployment are adequately understood and documented.</p>	<p>Accepts responsibility for creation of test cases using own in-depth technical analysis of both functional and non-functional specifications (such as reliability, efficiency, usability, maintainability and portability). Creates traceability records, from test cases back to requirements.</p>

Skill	Description	
	<p>Testing includes the process of engineering, using and maintaining testware (test cases, test scripts, test reports, test plans, etc.) to measure and improve the quality of the software being tested.</p>	<p>Produces test scripts, materials and regression test packs to test new and amended software or services. Specifies requirements for environment, data, resources and tools. Interprets, executes and documents complex test scripts using agreed methods and standards. Records and analyses actions and results, and maintains a defect register. Reviews test results and modifies tests if necessary. Provides reports on progress, anomalies, risks and issues associated with the overall project. Reports on system quality and collects metrics on test cases. Provides specialist advice to support others.</p>
User experience analysis	<p>The identification, analysis, clarification and communication of the context of use in which applications will operate, and of the goals of products, systems or services. Analysis and prioritisation of stakeholders' 'user experience' needs and definition of required system behaviour and performance. Resolution of potential conflicts between user requirements and determination of usability objectives</p>	<p>Analyses qualitative data (e.g. from site visits) and presents the data in ways that can be used to drive design (e.g. personas, red routes, user journey maps). Describes the user/ stakeholder objectives for the system, and identifies the roles of affected stakeholder groups. Defines the required behaviour and performance of the system in terms of the total use experience (e.g. in the form of scenarios of use), resolving potential conflicts between user requirements, (e.g. between accuracy and speed). Specifies measurable criteria for the required usability of the system.</p>

Skill	Description	
User experience design	The iterative development of user tasks, interaction and interfaces to meet user requirements, considering the whole user experience. Refinement of design solutions in response to user-centred evaluation and feedback and communication of the design to those responsible for implementation.	Collaborates with colleagues from other disciplines to define technology objectives, assess solution options and devise architectural solutions that both achieve strategic business goals and meet operational requirements. Creates design briefs for new web and digital projects or refreshes of existing projects. Develops visual user experiences across digital assets, working with project teams to present propositions and strategies. Rapidly translates digital concepts into hi-fidelity visual outputs and interactive prototypes. Captures multi-disciplinary requirements, and translates those requirements into user experiences, prototypes and final assets. Plans and costs UX activities, building in time for iteration, user feedback and design changes, and articulating the costs and benefits of different design approaches.

Skill	Description	
User experience evaluation	Evaluation of systems, products or services, to assure that the stakeholder and organisational requirements have been met, required practice has been followed, and systems in use continue to meet organisational and user needs. Iterative assessment (from early prototypes to final live implementation) of effectiveness, efficiency, user satisfaction, health and safety, and accessibility to measure or improve the usability of new or existing processes, with the intention of achieving optimum levels of product or service usability.	Plans and performs all types of evaluation, in order to check that stakeholder and organisational requirements have been met, choosing between formative and summative usability tests. Selects and administers moderated or unmoderated usability tests. Tests developing systems to ensure compatibility with user requirements, tasks and environment, as defined in agreed specifications. Checks systems in use for changes in organisational, user, other stakeholder, and usability needs and to ensure that these needs continue to be met.
		Assesses the stability of requirements against changes in context of use. Interprets and presents results of evaluations to design team(s), prioritising usability issues.
Systems integration	The incremental and logical integration and testing of components and/or subsystems and their interfaces in order to create operational services.	Defines the integration build, accepts software modules from software developers, and produces software builds for loading onto the target environment. Configures the hardware environment, produces integration test specifications, and conducts tests, recording details of any failures and carrying out fault diagnosis.

Skill	Description	
Porting/software configuration	The configuration of software products into new or existing software environments/platforms.	Configures software and equipment and tests platform-specific versions of one or more software products. Reports the outcome of testing and identifies potential improvements to the process and to the software products according to agreed designs and standards.
Hardware design	The specification and design of computing and communications equipment (such as semiconductor processors, HPC architectures and DSP and graphics processor chips), typically for integration into, or connection to an IT infrastructure or network. The identification of concepts and their translation into implementable design. The selection and integration, or design and prototyping of components. The adherence to industry standards including compatibility, security and sustainability.	Designs computing and communications equipment, taking account of target environment, performance, security and sustainability requirements. Translates logical designs into physical designs, and delivers technical prototypes of proposed components for approval by customer and execution by technicians. Designs tests to measure performance of prototypes and production output against specification and inform iterative development.

Skill	Description	
Systems installation/decommissioning	The installation, testing, implementation or decommissioning and removal of cabling, wiring, equipment, hardware and associated software, following plans and instructions and in accordance with agreed standards. The testing of hardware and software components, resolution of malfunctions, and recording of results. The reporting of details of hardware and software installed so that configuration management records can be updated.	Undertakes routine installations and de-installations of items of hardware and/or software. Takes action to ensure targets are met within established safety and quality procedures, including, where appropriate, handover to the client. Conducts tests of hardware and/or software using supplied test procedures and diagnostic tools. Corrects malfunctions, calling on other experienced colleagues and external resources if required. Documents details of all hardware/software items that have been installed and removed so that configuration management records can be updated. Develops installation procedures and standards, and schedules installation work. Provides specialist guidance and advice to less experienced colleagues to ensure best use is made of available assets, and to maintain or improve the installation service.
Availability management	The definition, analysis, planning, measurement, maintenance and improvement of all aspects of the availability of services, including the availability of power. The overall control and management of service availability to ensure that the level of service delivered in all services is matched to or exceeds the current and future agreed needs of the business, in a cost effective manner.	Contributes to the availability management process and its operation and performs defined availability management tasks. Analyses service and component availability, reliability, maintainability and serviceability. Ensures that services and components meet and continue to meet all of their agreed performance targets and service levels. Implements arrangements for disaster recovery and documents recovery procedures. Conducts testing of recovery procedures.

Skill	Description	
Service level management	The planning, implementation, control, review and audit of service provision, to meet customer business requirements. This includes negotiation, implementation and monitoring of service level agreements, and the ongoing management of operational facilities to provide the agreed levels of service, seeking continually and proactively to improve service delivery and sustainability targets.	Performs defined tasks to monitor service delivery against service level agreements and maintains records of relevant information. Analyses service records against agreed service levels regularly to identify actions required to maintain or improve levels of service, and initiates or reports these actions.
Service acceptance	The achievement of formal confirmation that service acceptance criteria have been met, and that the service provider is ready to operate the new service when it has been deployed. (Service acceptance criteria are used to ensure that a service meets the defined service requirements, including functionality, operational support, performance and quality requirements).	Engages with project management to confirm that products developed meet the service acceptance criteria and are to the required standard. Feeds into change management processes.

Skill	Description	
Configuration management	<p>The lifecycle planning, control and management of the assets of an organisation (such as documentation, software and service assets, including information relating to those assets and their relationships. This involves identification, classification and specification of all configuration items (CIs) and the interfaces to other processes and data. Required information relates to storage, access, service relationships, versions, problem reporting and change control of CIs. The application of status accounting and auditing, often in line with acknowledged external criteria such as ISO 9000, ISO/IEC 20000, ISO/IEC 27000 and security throughout all stages of the CI lifecycle, including the early stages of system development.</p>	<p>Maintains secure configuration, applying and maintaining tools, techniques and processes to identify, track, log and maintain accurate, complete and current information.</p>
Asset management	<p>The management of the lifecycle for all managed assets (hardware, software, intellectual property, licences, warranties etc.) including security, inventory, compliance, usage and disposal, aiming to protect and secure the corporate assets portfolio, optimise the total cost of ownership and sustainability by minimising operating costs, improving investment decisions and capitalising on potential opportunities. Knowledge and use of international standards for asset management and close integration with security, change, and configuration management are examples of enhanced asset management development.</p>	<p>Controls IT assets in one or more significant areas, ensuring that administration of the acquisition, storage, distribution, movement and disposal of assets is carried out. Produces and analyses registers and histories of authorised assets (including secure master copies of software, documentation, data, licenses and agreements for supply, warranty and maintenance), and verifies that all these assets are in a known state and location. Acts to highlight and resolve potential instances of unauthorised assets such as unlicensed copies of software.</p>

Skill	Description	
Change management	<p>The management of change to the service infrastructure including service assets, configuration items and associated documentation. Change management uses requests for change (RFC) for standard or emergency changes, and changes due to incidents or problems to provide effective control and reduction of risk to the availability, performance, security and compliance of the business services impacted by the change.</p>	<p>Assesses, analyses, develops, documents and implements changes based on requests for change.</p>
Release and deployment	<p>The management of the processes, systems and functions to package, build, test and deploy changes and updates (which are bounded as 'releases') into a live environment, establishing or continuing the specified Service, to enable controlled and effective handover to Operations and the user community.</p>	<p>Assesses and analyses release components. Provides input to scheduling. Carries out the builds and tests in coordination with testers and component specialists maintaining and administering the tools and methods – manual or automatic – and ensuring, where possible, information exchange with configuration management. Ensures release processes and procedures are maintained.</p>
System software	<p>The provision of specialist expertise to facilitate and execute the installation and maintenance of system software such as operating systems, data management products, office automation products and other utility software.</p>	<p>Reviews system software updates and identifies those that merit action. Tailors system software to maximise hardware functionality. Installs and tests new versions of system software. Investigates and coordinates the resolution of potential and actual service problems. Prepares and maintains operational documentation for system software. Advises on the correct and effective use of system software.</p>

Skill	Description	
Capacity management	<p>The management of the capability, functionality and sustainability of service components (including hardware, software, network resources and software/infrastructure as a Service) to meet current and forecast needs in a cost efficient manner aligned to the business. This includes predicting both long-term changes and short-term variations in the level of capacity required to execute the service, and deployment, where appropriate, of techniques to control the demand for a particular resource or service.</p>	<p>Monitors service component capacity and initiates actions to resolve any shortfalls according to agreed procedures. Applies techniques to control the demand upon a particular resource or service.</p>
Security administration	<p>The provision of operational security management and administrative services. Typically includes the authorisation and monitoring of access to IT facilities or infrastructure, the investigation of unauthorised access and compliance with relevant legislation.</p>	<p>Maintains security administration processes and checks that all requests for support are dealt with according to agreed procedures. Provides guidance in defining access rights and privileges. Investigates security breaches in accordance with established procedures and recommends required actions and supports/follows up to ensure these are implemented.</p>

Skill	Description	
Penetration testing	<p>The assessment of organisational vulnerabilities through the design and execution of penetration tests that demonstrate how an adversary can either subvert the organisation's security goals (e.g. the protection of specific Intellectual Property) or achieve specific adversarial objectives (e.g. establishment of a covert Command and Control infrastructure). Pen Test results provide deeper insight into the business risks of various vulnerabilities.</p>	<p>Maintains current knowledge of malware attacks, and other cyber security threats. Creates test cases using in-depth technical analysis of risks and typical vulnerabilities. Produces test scripts, materials and test packs to test new and existing software or services. Specifies requirements for environment, data, resources and tools. Interprets, executes and documents complex test scripts using agreed methods and standards. Records and analyses actions and results. Reviews test results and modifies tests if necessary. Provides reports on progress, anomalies, risks and issues associated with the overall project. Reports on system quality and collects metrics on test cases. Provides specialist advice to support others.</p>

Skill	Description	
Application support	<p>The provision of application maintenance and support services, either directly to users of the systems or to service delivery functions. Support typically includes investigation and resolution of issues and may also include performance monitoring. Issues may be resolved by providing advice or training to users, by devising corrections (permanent or temporary) for faults, making general or site-specific modifications, updating documentation, manipulating data, or defining enhancements support often involves close collaboration with the system's developers and/or with colleagues specialising in different areas, such as database administration or network support.</p>	<p>Maintains application support processes, and checks that all requests for support are dealt with according to agreed procedures. Uses application management software and tools to investigate issues, collect performance statistics and create reports.</p>
IT Infrastructure	<p>The operation and control of the IT infrastructure (typically hardware, software, data stored on various media, and all equipment within wide and local area networks) required to deliver and support IT services and products to meet the needs of a business. Includes preparation for new or changed services, operation of the change process, the maintenance of regulatory, legal and professional standards, the building and management of systems and components in virtualised computing environments and the monitoring of performance of systems and services in relation to their contribution to business performance, their security and their sustainability.</p>	<p>Provides technical expertise to enable the correct application of operational procedures. Uses network management tools to determine network load and performance statistics. Contributes to the planning and implementation of maintenance and installation work, including building and management of systems and components in virtualised computing environments. Implements agreed network changes and maintenance routines. Identifies operational problems and contributes to their resolution, checking that they are managed in accordance with agreed standards and procedures. Provides reports and proposals for improvement, to specialists, users and managers.</p>

Skill	Description	
Database administration	The installation, configuration, upgrade, administration, monitoring and maintenance of databases.	Uses database management system software and tools, and knowledge of logical database schemata, to investigate problems and collect performance statistics and create reports. Carries out routine configuration/installation and reconfiguration of database and related products.
Storage management	The planning, implementation, configuration and tuning of storage hardware and software covering online, offline, remote and offsite data storage (backup, archiving and recovery) and ensuring compliance with regulatory and security requirements.	Reviews capacity, performance, availability and other operational metrics and take appropriate action to ensure corrective and proactive maintenance of storage and backup systems to support the requirement to protect and secure business information. Creates reports and proposals for improvement and contributes to the planning and implementation of new installations and scheduled maintenance and changes within the system. Prepares and maintains operational procedures and provides technical expertise and appropriate information to the management.

Skill	Description	
Network support	The provision of network maintenance and support services. Support may be provided both to users of the systems and to service delivery functions. Support typically takes the form of investigating and resolving problems and providing information about the systems. It may also include monitoring their performance. Problems may be resolved by providing advice or training to users about the network's functionality, correct operation or constraints, by devising work-arounds, correcting faults, or making general or site-specific modifications.	Maintains the network support process and checks that all requests for support are dealt with according to agreed procedures. Uses network management software and tools to investigate and diagnose network problems, collect performance statistics and create reports, working with users, other staff and suppliers as appropriate.
Problem management	The resolution (both reactive and proactive) of problems throughout the information system lifecycle, including classification, prioritisation and initiation of action, documentation of root causes and implementation of remedies to prevent future incidents.	Initiates and monitors actions to investigate and resolve problems in systems, processes and services. Determines problem fixes/remedies. Assists with the implementation of agreed remedies and preventative measures.
Incident management	The processing and coordination of appropriate and timely responses to incident reports, including channelling requests for help to appropriate functions for resolution, monitoring resolution activity, and keeping clients appraised of progress towards service restoration.	Prioritises and diagnoses incidents according to agreed procedures. Investigates causes of incidents and seeks resolution. Escalates unresolved incidents. Facilitates recovery, following resolution of incidents. Documents and closes resolved incidents according to agreed procedures.

Skill	Description	
Facilities management	The planning, control and management of all the facilities which, collectively, make up the IT estate. This involves provision and management of the physical environment, including space and power allocation, and environmental monitoring to provide statistics on energy usage. Encompasses physical access control, and adherence to all mandatory policies and regulations concerning health and safety at work.	Uses data centre management tools to produce management information on power, cooling and space and investigate issues where necessary. Carries out routine audit and checks to ensure adherence to policies and procedures. Facilitates the implementation of mandatory electrical safety testing.
Learning and development management	The provision of learning and development processes (including learning management systems) in order to develop the professional, business and/or technical skills required by the organisation.	Contributes to the development and maintenance of a catalogue of learning and development resources. Books and organises learning events. Updates and controls training records, including attainment of certificates and accreditations.
Learning assessment and evaluation	The assessment of knowledge, skills and behaviour by any means whether formal or informal against capability and qualification frameworks such as SFIA. The evaluation of learning or education programmes against defined outcomes.	Performs routine and non-routine assessments of knowledge, skills and behaviour using specified methods and according to specified standards. Gathers inputs for the analysis and evaluation of learning programmes.

Skill	Description	
Learning design and development	The specification, design, creation, packaging and maintenance of materials and resources for use in learning and development in the workplace or in compulsory, further or higher education. Typically involves the assimilation of information from existing sources, selection and re-presentation in a form suitable to the intended purpose and audience. Includes instructional design, content development, configuration and testing of learning environments, and use of appropriate current technologies such as audio, video, simulation and assessment. May include third party accreditation.	Designs, creates, develops, customises and maintains learning materials and resources to deliver agreed outcomes, and meet accreditation requirements if appropriate. Assists with design, configuration and testing of learning environments, including creation of simulated data, and replication of external systems, interfaces and assessment systems.
Learning delivery	The transfer of business and/or technical skills and knowledge and the promotion of professional attitudes in order to facilitate learning and development. Uses a range of techniques, resources and media (which might include eLearning, on-line virtual environments, self-assessment, peer-assisted learning, simulation, and other current methods).	Prepares or customises and delivers learning activities to a variety of audiences.
Performance management	The optimisation of performance of people, including determination of capabilities, integration into teams, allocation of tasks, direction, support, guidance, motivation, and management of performance.	Supervises individuals and teams. Allocates routine tasks and/or project work. Provides direction, support and guidance as necessary, in line with individuals' skills and abilities. Monitors progress against agreed quality and performance criteria. Acts to facilitate effective working relationships between team members.

Skill	Description	
Resourcing	The overall resource management of the workforce to enable effective operation of the organisation. Provision of advice on any aspect of acquiring resources, including employees, consultants and contractors.	Implements resource plans, including conducting recruitment interviews. Facilitates selection, assessment and on-boarding processes, and internal resource allocation. Contributes to transitioning of resources, complying with relevant statutory or external regulations and codes of good practice.
Professional development	The facilitation of the professional development of individuals, including initiation, monitoring, review and validation of learning and development plans in line with organisational or business requirements. The counselling of participants in all relevant aspects of their continual professional development. The identification of appropriate learning/development resources. Liaison with internal and external training providers. The evaluation of the benefits of continual professional development activities.	Maintains skills framework, or information about access to standard frameworks. Advises on required outcomes for learning or development, from knowledge of skills frameworks and organisational development needs. Assists practitioners with the process of creating development plans based on outcome statements. Monitors practitioners' continuing professional development records, ensuring that achievements and enhanced capabilities are recorded and referenced to the outcome statements.
Quality management	The application of techniques for monitoring and improvement of quality to any aspect of a function or process. The achievement of, and maintenance of compliance to, national and international standards, as appropriate, and to internal policies, including those relating to sustainability and security.	Uses quality management models and techniques to identify areas for improvement. Determines corrective action to reduce errors and improve the quality of the system and services.
Quality assurance	The process of ensuring that the agreed quality standards within an organisation are adhered to and that best practice is promulgated throughout the organisation.	Investigates and documents the internal control of specified aspects of automated or partly automated processes, and assesses compliance with the relevant standard.

Skill	Description	
Quality standards	The development, maintenance, control and distribution of quality standards.	Controls, updates and distributes new and revised quality standards, including technical changes.
Conformance review	The independent assessment of the conformity of any activity, process, deliverable, product or service to the criteria of specified standards, best practice, or other documented requirements. May relate to, for example, asset management, Network Security tools, firewalls and internet security, sustainability, real-time systems, application design and specific certifications.	Conducts formal reviews of activities, processes, products or services. Collects, collates and examines records as part of specified testing strategies for evidence of compliance with management directives, or the identification of abnormal occurrences. Analyses evidence collated and drafts part or all of formal reports commenting on the conformance found to exist in the reviewed part of an information systems environment.
Digital forensics	The collection, processing, preserving, analysing, and presenting of computer-related evidence in support of security vulnerability mitigation and/or criminal, fraud, counterintelligence, or law enforcement investigations.	Contributes to digital Forensic Investigations. Processes and analyses computer evidence in line with policy, standards and guideline and supports production of forensics findings and reports.

Skill	Description	
Sourcing	<p>The provision of policy, internal standards and advice on the procurement or commissioning of externally supplied and internally developed products and services. The provision of commercial governance, conformance to legislation and assurance of information security. The implementation of compliant procurement processes, taking full account of the issues and imperatives of both the commissioning and supplier sides. The identification and management of suppliers to ensure successful delivery of products and services required by the business.</p>	<p>Reviews business cases (requirements, potential benefits and options) and determines appropriate procurement routes, e.g., open market or collaborative framework. Using market knowledge to inform specifications, ensures detailed pre-qualification questionnaires and tender invitations are prepared. Collects and collates data to support collaboration and negotiates terms and conditions to reflect the scale of requirements and encourage good performance.</p>
		<p>Evaluates tenders based on specification and evaluation criteria, prepares acceptance documentation and advises on contracts and service level agreements. Monitors and reports on supplier performance, information security, customer satisfaction, and market intelligence. Investigates, resolves or escalates problems. Implements supplier service improvement actions and programmes.</p>

Skill	Description	
Contract management	The overall management and control of the operation of formal contracts for supply of products and services.	Sources and collects contract performance data (such as pricing and supply chain costs), and monitors performance against KPIs. Identifies and reports under-performance and develops opportunities for improvement. Monitors compliance with Terms and Conditions and take appropriate steps to address non-compliance. Pro-actively manages risk and reward mechanisms in the contract. Monitors progress against business objectives specified in the business case. Identifies where change is required, and plans for variations. In consultation with stakeholders, ensures that change management protocols are implemented.
Relationship management	The identification, analysis, management and monitoring of relationships with and between stakeholders. (Stakeholders are individuals, groups, or organisations who may affect, be affected by, or perceive themselves to be affected by decisions, activities and outcomes related to products, services or changes to products and services.) The clarification of mutual needs and commitments through consultation and consideration of impacts. For example, the coordination of all promotional activities to one or more clients to achieve satisfaction for the client and an acceptable return for the supplier; assistance to the client to ensure that maximum benefit is gained from products and services supplied.	Implements stakeholder engagement/ communications plans, including, for example: handling of complaints; problems and issues; managing resolutions; corrective actions and lessons learned; collection and dissemination of relevant information. Uses feedback from customers and stakeholders to help measure effectiveness of stakeholder management. Helps develop and enhance customer and stakeholder relationships.

Skill	Description	
Customer service support	The management and operation of one or more customer service or service desk functions. Acting as a point of contact to support service users and customers reporting issues, requesting information, access, or other services.	Monitors customer service or service desk functions, and collects performance data. Assists with the specification, development, research and evaluation of services standards. Applies these standards to resolve or escalate issues and gives technical briefings to staff members.
Digital marketing	Integration of digital marketing with traditional print/broadcast methods, to support the research, analysis and stimulation of potential or existing markets for products and services, both to provide a sound basis for business development and to generate a satisfactory flow of sales enquiries. The management and development of strategies, campaigns and day-to-day marketing activity delivered through web and other appropriate digital channels and technologies.	Appraises factors that influence online marketing activity, carries out market research, and identifies unique selling points and key messages. Investigates and analyses customer and competitor dynamics and uses appropriate channels and technologies for target marketing and engagement.
		Recognises and uses the similarities and differences between online and traditional marketing concepts and applications, providing advice on channel methodology, effectiveness and implementation. Makes creative use of elements relevant to both digital and traditional environments, and drafts appropriate support materials. Analyses the effectiveness of campaigns and services and their impact on audience behaviour and business outcomes. Organises and participates actively in marketing events.

Skill	Description	
Selling	The identification of sales prospects and their qualification, the development of customer interest and the preparation (including managing the bid process), execution and monitoring of the sale of any product or service into an external or internal market.	Collects and uses information in order to achieve sales objectives. Responds to existing sales leads and identifies and qualifies new leads and prospects with a view to developing a pipeline of potential opportunities. Understands customer and needs, and develops and enhances customer relationships, before, during and after the conclusion of agreements/contracts. Key tasks may also include bid management, value analysis, negotiation, presentation and preparation of contracts. Monitors and reports on quota, performance, customer satisfaction, market intelligence and competitors.
Sales support	The provision of technical advice and assistance to the sales force, sales agents, reseller/distributor staff and existing or prospective customers, either in support of customer development or sales activity or in fulfilment of sales obligations.	Works closely with the sales team to help prospects to clarify their needs and requirements; devises solutions and assesses their feasibility and practicality. Demonstrates technical feasibility using physical or simulation models. Produces estimates of cost and risk and initial project plans to inform sales proposals. Resolves technical problems.

Skill	Description	
Product management	The active management of a product or service throughout its lifecycle (inception through to retirement) in order to address a market opportunity/customer need and generate the greatest possible value for the business.	Manages aspects of the product lifecycle, working with colleagues in other disciplines to enable effective marketing and customer support. May act as product owner for one or more lower value products or services. Facilitates product sales by planning development of marketing collateral content, supporting and evaluating campaigns, and monitoring product performance.

Appendix 4: Mapping of Pearson BTEC HND in Computing against FHEQ Level 5

Key	
KU	Knowledge and Understanding
CS	Cognitive Skills
AS	Applied Skills
TS	Transferable Skills

The qualification will be awarded to students who have demonstrated:

FHEQ Level 5 descriptor		Computing HND Programme Outcome
Knowledge and critical understanding of the well-established principles of their area(s) of study, and of the way in which those principles have developed	KU1	Knowledge and understanding of the fundamental principles and practices of the contemporary global computing environment.
	KU2	Understanding and insight into different organisations, their diverse nature, purposes, structures and operations and their influence upon the external environment.
	KU3	A critical understanding of the evolving concepts, theories and models within the study of computing across a range of practical and hypothetical scenarios.
	KU4	An ability to evaluate and analyse a range of concepts, theories and models to make appropriate decisions.
	KU5	An appreciation of the concepts and principles of CPD, staff development, leadership and reflective practice as methods and strategies for personal and people development.
	KU6	Knowledge and understanding of vital concepts, principles and theories relating to computing and computer applications, software development, networking and media systems.

FHEQ Level 5 descriptor		Computing HND Programme Outcome
	KU7	Critical understanding of how computer-based technologies interrelate and communicate with one another, support processes and lead to a computerised solution to a problem.
	KU8	Understanding of the application of appropriate mathematical techniques in the design and development of software and computer systems.
	KU9	Critical understanding of the use of industry standard technical documentation and practices.
	KU10	Develop a range of multi-disciplined programming and coding skills.
	KU11	Deploy appropriate tools, theories, principles and methodologies to analyse, specify, construct, test and evaluate a computer based system in an appropriate context
	KU12	An ability to apply industry-standard methods in human-computer interaction to inform the development of usable interfaces.
Ability to apply underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context	AS1	Evidence the ability to show client relationship management and develop appropriate policies and strategies to meet stakeholder expectations.
	AS2	Apply innovative ideas to develop and create new systems or services that respond to the changing nature of organisations.
	AS3	Integrate theory and practice through the investigation and examination of practices in the workplace.
	AS4	Develop outcomes for clients using appropriate practices and data to make justified recommendations.

FHEQ Level 5 descriptor		Computing HND Programme Outcome
	AS5	Apply IT concepts and principles to critically evaluate and analyse complex practical problems and provide IT based solutions.
	AS6	Effectively apply appropriate computer based technologies to analyse, develop and maintain reliable software.
	CS1	Deploy appropriate theory, practices and tools in order to analyse, specify, design and implement computing systems and software applications.
	CS2	Recognise and critically evaluate the professional, economic, social, environmental, moral and ethical issues that influence the sustainable exploitation of computer-based technologies.
	AS7	Employ a range of analytical techniques and design tools in the development of secure software.
Knowledge of the main methods of enquiry in the subject(s) relevant to the named award, and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study.	CS3	Critique a range of systems and operations and their application to maximise and successfully meet strategic objectives.
	KU13	An understanding of the appropriate techniques and methodologies used to resolve real-life problems in the workplace.
	TS1	Develop a skill set to enable the evaluation of appropriate actions taken for solving problems in a specific organisational context.
An understanding of the limits of their knowledge, and how this influences analysis and interpretations based on that knowledge.	TS2	Self-reflection, including self-awareness; the ability to become an effective self-student and appreciate the value of the self-reflection process.
	TS3	Undertake independent learning to expand on own skills and delivered content.

Typically, holders of the qualification will be able to:

FHEQ Level 5 descriptor		Computing HND Programme Outcomes
Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis.	TS4	Competently use digital literacy to access a broad range of research sources, data and information.
	CS4	Interpret, analyse and evaluate a range of data, sources and information to inform evidence-based decision making.
	CS5	Synthesise knowledge and critically evaluate strategies and plans to understand the relationship between theory and real-world scenarios.
Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively.	TS5	Communicate confidently and effectively, both orally and in writing, both internally and externally with organisations and other stakeholders.
	TS6	Communicate ideas and arguments in an innovative manner using a range of digital media.
	AS8	Locate, receive and respond to a variety of information sources (e.g. textual, numerical, graphical and computer-based) in defined contexts.
	TS7	Communicate effectively, verbally and in writing and articulate well-defined issues, for a variety of purposes, taking into account the audience viewpoint
	TS8	Demonstrate strong interpersonal skills, including effective listening and oral communication skills, as well as the associated ability to persuade, present, pitch and negotiate.
Undertake further training, develop existing skills and acquire new competences that will enable them to assume significant responsibility within organisations	TS9	Identify personal and professional goals for continuing professional development in order to enhance competence to practise within a chosen computing field.
	TS10	Take advantage of available pathways for continuing professional development through higher education, Professional Body Qualifications and Vendor Accredited Certifications.

Holders will also have:

FHEQ Level 5 descriptor		Computing HND Programme Outcomes
The qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and decision-making.	TS11	Develop a range of skills to ensure effective team working, independent initiatives, organisational competence and problem-solving strategies.
	TS12	Show an ability to work as a member of a development team, recognising the different roles within a team and the different ways of organising teams
	TS13	Reflect adaptability and flexibility in approach to work; showing resilience under pressure and meeting challenging targets within given deadlines.
	TS14	Use quantitative skills to manipulate data, evaluate and verify existing theory.
	TS15	Show awareness of current developments within the computing industry and their impact on employability and CPD.
	TS16	Manage small to medium scale projects using appropriate planning and time management techniques.
	CS6	Evaluate the changing needs of the business environment and have confidence to self-evaluate and undertake additional CPD as necessary.
	TS17	Display emotional intelligence and sensitivity to diversity in relation to people and cultures.

Appendix 5: Glossary of terms used for internally assessed units

This is a summary of the key terms used to define the requirements within units.

Term	Definition
Analyse	<p>Present the outcome of methodical and detailed examination either:</p> <ul style="list-style-type: none">• breaking down a theme, topic or situation in order to interpret and study the interrelationships between the parts and/or of information or data to interpret and study key trends and interrelationships. <p>Analysis can be through activity, practice, written or verbal presentation.</p>
Apply	<p>Put into operation or use.</p> <p>Use relevant skills/knowledge/understanding appropriate to context.</p>
Arrange	Organise or make plans.
Assess	Offer a reasoned judgement of the standard/quality of a situation or a skill informed by relevant facts.
Calculate	Generate a numerical answer with workings shown.
Compare	<p>Identify the main factors relating to two or more items/situations or aspects of a subject that is extended to explain the similarities, differences, advantages and disadvantages.</p> <p>This is used to show depth of knowledge through selection of characteristics.</p>
Compose	Create or make up or form.
Communicate	<p>Convey ideas or information to others.</p> <p>Create/construct skills to make or do something, for example a display or set of accounts.</p>
Create/Construct	Skills to make or do something, for example a display or set of accounts.
Critically analyse	Separate information into components and identify characteristics with depth to the justification.

Term	Definition
Critically evaluate	Make a judgement taking into account different factors and using available knowledge/experience/evidence where the judgement is supported in depth.
Define	State the nature, scope or meaning.
Describe	Give an account, including all the relevant characteristics, qualities and events.
Discuss	Consider different aspects of: <ul style="list-style-type: none"> • a theme or topic; how they interrelate; and the extent to which they are important.
Demonstrate	Show knowledge and understanding.
Design	Plan and present ideas to show the layout/function/workings/object/system/process.
Develop	Grow or progress a plan, ideas, skills and understanding
Differentiate	Recognise or determine what makes something different.
Discuss	Give an account that addresses a range of ideas and arguments
Evaluate	<p>Work draws on varied information, themes or concepts to consider aspects, such as:</p> <ul style="list-style-type: none"> • strengths or weaknesses • advantages or disadvantages • alternative actions • relevance or significance <p>Students' inquiries should lead to a supported judgement showing relationship to its context. This will often be in a conclusion. Evidence will often be written but could be through presentation or activity.</p>
Explain	To give an account of the purposes or reasons.
Explore	Skills and/or knowledge involving practical research or testing.
Identify	Indicate the main features or purpose of something by recognising it and/or being able to discern and understand facts or qualities.
Illustrate	Make clear by using examples or provide diagrams.
Indicate	Point out, show.
Interpret	State the meaning, purpose or qualities of something through the use of images, words or other expression.

Term	Definition
Investigate	Conduct an inquiry or study into something to discover and examine facts and information.
Justify	Students give reasons or evidence to: <ul style="list-style-type: none"> • support an opinion; or prove something right or reasonable.
Outline	Set out the main points/characteristics.
Plan	Consider, set out and communicate what is to be done.
Produce	To bring into existence.
Reconstruct	To assemble again/reorganise/form an impression.
Report	Adhere to protocols, codes and conventions where, findings or judgements are set down in an objective way.
Review	Make a formal assessment of work produced. The assessment allows students to: <ul style="list-style-type: none"> • appraise existing information or prior events reconsider information with the intention of making changes, if necessary.
Show how	Demonstrate the application of certain methods/theories/concepts.
Stage & Manage	Organisation and management skills, for example running an event or a business pitch.
State	Express
Suggest	Give possible alternatives, produce an idea, put forward, e.g. an idea or plan, for consideration
Undertake/ Carry Out	Undertake/carry out. Use a range of skills to perform a task, research or activity.

This is a key summary of the types of evidence used for Pearson BTEC Higher Nationals:

Type of evidence	Definition
Case study	A specific example to which all students must select and apply knowledge.
Project	A large scale activity requiring self-direction of selection of outcome, planning, research, exploration, outcome and review.
Independent research	An analysis of substantive research organised by the student from secondary sources and, if applicable, primary sources.
Written task or report	Individual completion of a task in a work-related format, e.g. a report, marketing communication, set of instructions, giving information.
Simulated activity/ role play	A multi-faceted activity mimicking realistic work situations.
Team task	Students work together to show skills in defining and structuring activity as a team.
Presentation	Oral or through demonstration.
Production of plan/business plan	Students produce a plan as an outcome related to a given or limited task.
Reflective journal	Completion of a journal from work experience, detailing skills acquired for employability.
Poster/leaflet	Documents providing well-presented information for a given purpose.

Appendix 6: Assessment methods and techniques for Pearson BTEC Higher Nationals

Assessment technique	Description	Transferable skills development	Formative or Summative
Academic graphic display	This technique asks students to create documents providing well-presented information for a given purpose. Could be a hard or soft copy.	Creativity Written Communication Information and Communications Technology Literacy	Formative Summative
Case study	This technique present students with a specific example to which they must select and apply knowledge.	Reasoning Critical thinking Analysis	Formative Summative
Discussion forum	This technique allows students to express their understanding and perceptions about topics and questions presented in the class or digitally, for example, online groups, blogs.	Oral/written communication Appreciation of diversity Critical thinking and reasoning Argumentation	Formative
Independent research	This technique is an analysis of research organised by the student from secondary sources and, if applicable, primary sources.	Information and communications technology Literacy Analysis	Formative

Assessment technique	Description	Transferable skills development	Formative or Summative
Oral/Viva	This technique asks students to display their knowledge of the subject via questioning.	Oral communication Critical thinking Reasoning	Summative
Peer-review	This technique asks students to provide feedback on each other's performance. This feedback can be collated for development purposes.	Teamwork Collaboration Negotiation	Formative Summative
Presentation	This technique asks students to deliver a project orally or through demonstration.	Oral communication Critical thinking Reasoning Creativity	Formative Summative
Production of an artefact/ performance or portfolio	This technique requires students to demonstrate that they have mastered skills and competencies by producing something. Some examples are Computing plans, using a piece of equipment or a technique, building models, developing, interpreting, and using maps.	Creativity Interpretation Written and oral communication Interpretation Decision-making Initiative Information and Communications Technology Literacy, etc	Summative

Assessment technique	Description	Transferable skills development	Formative or Summative
Project	This technique is a large scale activity requiring self-direction, planning, research, exploration, outcome and review.	Written communication Information Literacy Creativity Initiative	Summative
Role playing	This technique is a type of case study, in which there is an explicit situation established, with students playing specific roles, understanding what they would say or do in that situation.	Written and oral communication Leadership Information literacy Creativity Initiative	Formative
Self-reflection	This technique asks students to reflect on their performance, for example, to write statements of their personal goals for the course at the beginning of the course, what they have learned at the end of the course and their assessment of their performance and contribution; completion of a reflective journal from work experience, detailing skills acquired for employability.	Self-reflection Written communication Initiative Decision-making Critical thinking	Summative

Assessment technique	Description	Transferable skills development	Formative or Summative
Simulated activity	This technique is a multi-faceted activity based on realistic work situations.	Self-reflection Written communication Initiative Decision-making Critical thinking	Formative Summative
Team assessment	This technique asks students to work together to show skills in defining and structuring an activity as a team. All team assessment should be distributed equally, each of the group members performing their role, and then the team collates the outcomes, and submits it as a single piece of work.	Collaboration Teamwork Leadership Negotiation Written and oral communication	Formative Summative
Tiered knowledge	This technique encourages students to identify their gaps in knowledge. Students record the main points they have captured well and those they did not understand.	Critical thinking Analysis Interpretation Decision-making Oral and written communication	Formative

Assessment technique	Description	Transferable skills development	Formative or Summative
Time-constrained assessment	This technique covers all assessment that needs to be done within a centre-specified time-constrained period on-site.	Reasoning Analysis Written communication Critical thinking Interpretation	Summative
Top ten	This technique asks students to create a 'top ten' list of key concepts presented in the assigned reading list.	Teamwork Creativity Analysis Collaboration	Formative
Written task or report	This technique asks students to complete an assignment in a structured written format, for example, a Computing plan, a report, marketing communication, set of instructions, giving information.	Reasoning Analysis Written communication Critical thinking, interpretation.	Summative

Appendix 7: Pearson BTEC HNC/HND Computing Programme Outcomes for Students

	Knowledge and Understanding													Cognitive skills						Applied skills								Transferable skills																		
Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
1	X		X	X		X	X	X	X	X	X	X		X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X		X	X			
2	X	X	X	X		X	X		X		X			X		X		X			X		X	X	X			X	X	X	X	X	X	X		X	X	X	X	X		X	X			
3	X	X	X	X	X	X			X		X		X		X	X		X	X	X		X							X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	
4	X	X	X	X		X	X		X	X	X	X	X	X		X	X	X	X			X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X		X	X		
5	X		X			X			X						X	X		X			X		X	X	X				X	X	X	X	X	X	X		X	X	X		X		X			
6	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X
7	X	X	X	X		X	X		X	X	X			X		X	X	X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X	X	X				
8	X		X			X	X		X	X	X	X		X		X		X		X	X		X	X	X			X	X	X	X	X	X	X		X	X	X	X	X		X	X			
9	X		X	X	X	X	X		X				X	X		X		X		X	X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X			
10	X	X	X	X		X	X		X	X	X	X		X	X	X		X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	X		
11				X		X		X	X									X									X	X	X	X	X					X		X		X	X	X				
12	X		X	X		X	X	X	X		X			X		X	X	X			X		X	X	X		X	X	X	X	X	X	X	X		X		X		X	X	X				
13	X	X	X	X	X	X	X		X		X		X	X	X	X	X	X	X	X	X	X		X				X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	
14	X	X	X	X	X	X			X				X		X		X	X	X	X	X	X	X	X				X		X	X	X	X	X	X	X	X		X	X	X		X	X	X	
15	X		X			X	X		X		X			X		X		X			X		X	X	X			X	X	X	X	X	X	X		X	X	X	X	X		X	X			
16	X		X			X	X		X	X	X			X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X		X	X			
17	X		X	X		X	X		X		X			X		X		X		X	X		X	X	X			X	X	X	X	X	X	X		X		X	X	X		X	X			
18				X		X		X	X									X									X	X	X	X	X					X		X		X	X	X				
19	X		X	X		X		X	X		X			X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X			
20	X		X	X		X	X	X	X	X	X	X		X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X		X	X			
21	X	X	X	X		X		X	X	X	X			X		X	X	X			X		X	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X					
22	X		X	X		X		X	X		X			X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X	X	X				
23	X	X	X	X		X		X	X									X			X		X	X	X			X	X	X	X	X	X	X		X		X		X	X	X	X			

	Knowledge and Understanding													Cognitive skills						Applied skills								Transferable skills																
Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
24	X	X	X	X		X			X		X							X			X		X	X	X			X	X	X	X	X	X	X		X		X		X		X	X	
25	X	X	X	X		X			X		X			X	X	X	X	X		X	X		X	X	X	X		X	X	X	X	X	X	X		X		X		X		X	X	X
26	X		X			X	X		X	X	X			X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	
27	X		X			X			X		X			X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	X
28	X		X	X		X	X		X	X	X	X		X		X		X		X	X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	
29	X		X			X			X		X			X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	
30	X	X	X	X		X	X		X	X	X	X		X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X		X	X	
31	X		X	X		X	X		X		X			X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	
32	X		X	X		X	X		X	X	X	X		X	X	X		X		X	X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	X
33				X		X		X	X									X									X	X	X	X	X					X	X	X		X	X			
34	X	X	X	X	X	X			X		X		X	X		X	X	X			X		X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X		X	X	
35	X	X	X	X		X			X		X			X		X		X			X		X	X	X			X	X	X	X	X	X	X		X		X	X	X		X	X	
36	X		X			X	X		X	X	X			X		X		X			X		X	X	X			X	X	X	X	X	X	X		X		X	X	X		X	X	
37	X		X			X			X		X			X		X		X			X		X	X	X			X	X	X	X	X	X	X		X		X	X	X		X	X	
38	X	X	X	X		X	X		X	X	X	X		X		X		X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	
39	X	X	X	X	X	X			X						X		X	X					X	X	X				X	X	X	X	X	X		X		X		X		X	X	
40	X	X	X	X		X	X		X	X	X	X		X		X		X		X	X		X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X		X	X	X
41	X		X			X		X	X	X	X			X		X		X			X		X	X	X			X	X	X	X	X	X	X		X		X	X	X		X	X	
42	X	X	X	X		X			X		X		X	X	X	X	X	X					X	X	X		X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	
43	X	X	X			X			X	X	X			X	X	X		X		X	X		X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X		X	X	
44	X		X	X		X	X		X	X	X			X	X	X		X			X		X	X	X			X	X	X	X	X	X	X		X		X	X	X		X	X	
45	X	X	X		X	X			X		X				X	X	X	X	X										X	X	X	X	X	X		X		X		X		X	X	
46	X		X	X		X	X		X	X	X	X		X	X	X		X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	
47	X		X	X		X	X		X	X	X	X		X	X	X		X			X		X	X	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X	X

	Knowledge and Understanding													Cognitive skills						Applied skills								Transferable skills																
Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
48	X	X	X			X			X		X			X	X	X		X		X	X		X	X	X			X	X	X	X	X	X	X		X	X	X	X	X		X	X	
49	X		X			X	X		X	X	X			X		X		X			X		X	X	X			X	X	X	X	X	X	X		X	X	X	X	X		X	X	

Appendix 8: Transferable skills mapping

Level 5 Higher National Diploma in Computing: mapping of transferable employability and academic study skills

Skill Set	Cognitive skills							Intra-personal Skills				Interpersonal Skills		
Unit	Problem Solving	Critical Thinking/Analysis	Decision Making	Effective Communication	Digital Literacy	Numeracy	Creativity	Plan Prioritise	Self-Management	Independent learning	Self-Reflection	Team Work	Leadership	Cultural Awareness
1	X	X	X		X		X	X	X		X			
2	X	X	X		X		X	X	X	X	X			X
3		X	X	X			X	X	X	X	X	X	X	X
4	X	X	X		X	X	X	X	X	X	X			
5	X	X	X		X			X	X	X	X			
6	X	X	X	X	X		X	X	X	X	X	X	X	X
7	X	X	X		X	X		X	X	X	X			
8	X	X	X	X	X	X	X	X	X	X	X			
9	X	X	X	X	X	X	X	X	X	X	X	X	X	
10	X	X	X	X	X		X	X	X	X	X		X	
11	X	X	X			X		X	X	X				
12	X	X	X		X	X		X	X	X	X			
13	X	X	X	X	X		X	X	X	X	X		X	
14		X	X	X	X		X	X		X	X			X
15	X	X	X	X	X	X	X	X	X	X	X			
16	X	X	X	X	X	X	X	X	X	X	X			
17	X	X	X	X	X			X	X	X	X		X	X

Skill Set	Cognitive skills							Intra-personal Skills				Interpersonal Skills		
Unit	Problem Solving	Critical Thinking/Analysis	Decision Making	Effective Communication	Digital Literacy	Numeracy	Creativity	Plan Prioritise	Self-Management	Independent learning	Self-Reflection	Team Work	Leadership	Cultural Awareness
18	X	X	X			X		X	X	X	X			
19	X	X	X	X	X	X	X	X	X	X	X		X	
20	X	X	X		X	X	X	X	X	X	X			
21	X	X	X			X	X	X	X	X	X			
22	X	X	X	X	X	X	X	X	X		X			
23		X		X	X	X			X	X	X			
24	X	X	X		X	X	X	X	X	X	X			
25	X	X	X	X	X			X	X	X	X		X	
26	X	X	X	X	X	X	X	X	X	X	X			
27	X	X	X	X	X	X	X	X	X	X	X		X	
28	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29	X	X	X	X	X		X	X	X	X	X	X	X	X
30	X	X	X	X	X	X	X	X	X	X	X		X	
31	X	X	X	X	X		X	X	X	X	X	X	X	X
32	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33	X	X	X		X	X	X	X	X	X	X			
34	X	X	X	X	X		X	X	X	X	X	X	X	X
35	X	X	X	X	X			X	X	X	X			
36	X	X	X	X	X		X	X	X	X	X			
37	X	X	X	X	X		X	X	X	X	X			
38	X	X	X	X	X		X	X	X	X	X	X	X	
39	X	X	X	X	X		X	X	X	X	X	X	X	X

Skill Set	Cognitive skills							Intra-personal Skills				Interpersonal Skills		
Unit	Problem Solving	Critical Thinking/Analysis	Decision Making	Effective Communication	Digital Literacy	Numeracy	Creativity	Plan Prioritise	Self-Management	Independent learning	Self-Reflection	Team Work	Leadership	Cultural Awareness
40	X	X	X	X	X		X	X	X	X	X	X	X	X
41	X	X	X	X	X		X	X	X	X	X	X		
42	X	X	X	X	X			X	X	X	X		X	
43	X	X	X	X	X		X	X	X	X	X		X	X
44	X	X	X	X	X	X	X	X	X	X	X			
45		X	X	X	X				X	X	X			X
46	X	X	X	X	X	X	X	X	X	X	X	X	X	X
47	X	X	X	X	X		X	X	X	X	X	X	X	X
48	X	X	X		X			X	X	X	X			
49	X	X	X		X		X	X	X	X	X	X	X	

Appendix 9: Recognition of Prior Learning

QCF Pearson BTEC Level 4 Higher National Certificate in Computing unit content mapped to the Level 4 units available in the Pearson BTEC Higher National Computing programmes (RQF)

HNCs in Computing: Unit Mapping Overview

This mapping document is designed to support centres who wish to recognise student achievement in older QCF Higher Nationals within the new RQF suites. The document demonstrates where content is covered in the new suite, and where there is new content to cover to ensure full coverage of learning outcomes.

P – Partial mapping (some topics from the old unit appear in the new unit)

X – Full mapping + new (all the topics from the old unit appear in the new unit, but new unit also contains new topic(s))

N – New unit

Unit no.	Unit title New RQF HN programme	Maps to unit number on existing QCF HN programme	Level of similarity between units
1	Programming	18	P
		19	P
		20	P
		34	P
2	Networking	24	X
3	Professional Practice	3	X
		50	P
4	Database Design & Development	17	P
		21	X
5	Security	48	P
6	Planning Computing Project	4	P
		7	P
7	Software Development Lifecycles	9	P
8	Data Analytics		N
9	Computer Systems Architecture	25	P

Unit no.	Unit title New RQF HN programme	Maps to unit number on existing QCF HN programme	Level of similarity between units
11	Strategic Information Systems	30	X
13	Website Design & Development	14	P
		36	P
14	Maths for Computing		N

HNCs in Computing: Unit Mapping in Depth

The RQF Pearson BTEC Level 4 HNC Certificate in Computing mapped against the current QCF Pearson BTEC Level 4 HNC Certificate in Computing units (specification end date 31/12/17).

RQF HNC Units		QCF HNC units		Mapping comments	
No	RQF unit title	No	QCF unit title	QCF LOs	RQF LOs
1	Programming	18	Procedural Programming	Unit 18 LO1	Unit 1 LO2
		19	Object Oriented Programming	Unit 19 LO1	Unit 1 LO2
		20	Event Driven Programming Solutions	Unit 20 LO1	Unit 1 LO2
		34	Data Structures and Algorithms	Unit 34 LO1	Unit 1 LO1
2	Networking	24	Networking Technologies	Unit 24 LO1 Unit 24 LO2 Unit 24 LO3 Unit 24 LO4	Unit 2 LO1 Unit 2 LO2 Unit 2 LO3 Unit 2 LO4
3	Professional Practice	3	Employability and Professional Development	Unit 3 LO2 Unit 3 LO4 Unit 3 LO3 Unit 3 LO1	Unit 3 LO1 Unit 3 LO2 Unit 3 LO3 Unit 3 LO4
		50	Work-based Experience	Unit 50 LO1	Unit 3 LO4
4	Database Design & Development	17	Database Design Concepts	Unit 17 LO2 Unit 17 LO3	Unit 4 LO1 Unit 4 LO2
		21	Software Applications Testing	Unit 21 LO1-4	Unit 4 LO3
5	Security	48	IT Security Management	Unit 48 LO1 Unit 48 LO3 Unit 48 LO4	Unit 5 LO1 Unit 5 LO3 Unit 5 LO4

RQF HNC Units		QCF HNC units		Mapping comments	
No	RQF unit title	No	QCF unit title	QCF LOs	RQF LOs
6	Planning a Computing Project	4	Project Design Implementation and Evaluation	Unit 4 LO4 Unit 4 LO3	Unit 6 LO3 Unit 6 LO4
		7	Research Skills	Unit 7 LO2	Unit 6 LO2
11	Strategic Information Systems	30	Information Systems in Organisations	Unit 30 LO1 Unit 30 LO2 Unit 30 LO3	Unit 11 LO1 Unit 11 LO2 Unit 11 LO3
9	Computer Systems Architecture	25	Routing Concepts	Unit 25 LO4	Unit 9 LO4
7	Software Development Lifecycles	9	Systems Analysis and Design	Unit 9 LO1 Unit 9 LO2	Unit 7 LO1 Unit 7 LO2
13	Website Design & Development	14	Website Design	Unit 14 LO4	Unit 13 LO4
		36	Internet Server Management	Unit 36 LO1 Unit 36 LO2	Unit 13 LO1 Unit 13 LO1

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