Group Award Specification for:

HND Computer Science

Group Award Code: GG7D 16

Validation date: December 2012

Date of original publication: April 2013

Version: 22 (September 2021)

Contents

1 Introduction

This document was previously known as the Arrangements document. The purpose of this document is to:

- assist centres to implement, deliver and manage the qualification
- provide a guide for new staff involved in offering the qualification
- inform course managers teaching staff, assessors, learners, employers and HEIs of the aims and purpose of the qualification
- provide details of the range of learners the qualification is suitable for and progression opportunities

1.1 Background

The current development began in June 2010 with a public consultation meeting attended by 58 representatives, spanning 32 colleges.

One major finding during this phase was the sector's preference for a single development that encompassed Computing and Networking. HN Computing has previously been a family of awards consisting of: HNC Computing, HND Computing: Software Development, and HND Computing: Technical Support. The QDT, supported by Heads of Computing, wanted the review of these awards to embrace the review of HN Computer Networking, which was also due to commence as a separate development. As a result, the 'HN Review', as it was known, encompassed five awards:

1 HNC Computing
2 HND Computing: Technical Support
3 HND Computing: Software Development
4 HNC Computer Networking
5 HND Computer Networking and Internetworking Technology

At this stage, it was agreed to combine the HNCs into a single award, and introduce a new HND award (HND Computer Science). The HN Review, therefore, sought to develop the following awards:

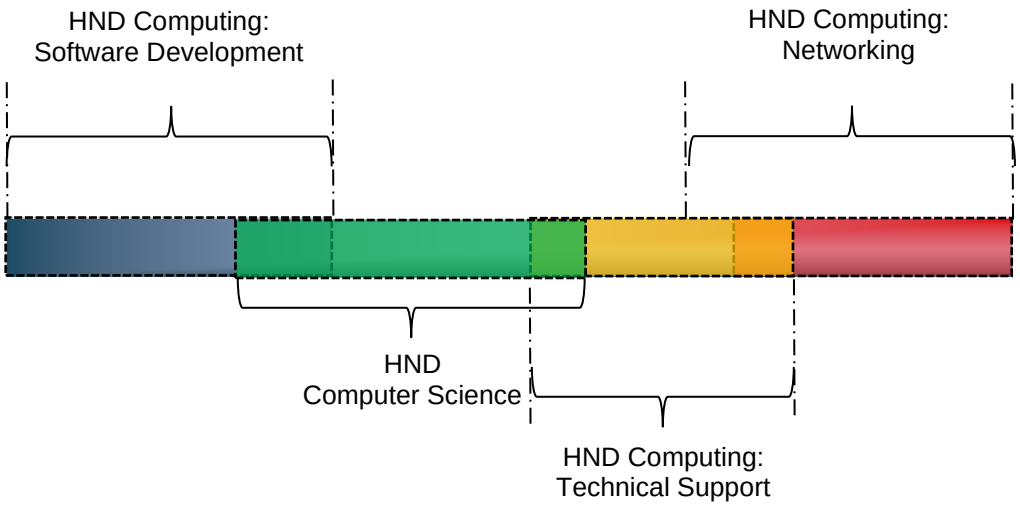
1 HNC Computing (based on HNC Computing and HNC Computer Networking)
2 HND Computer Science (new award)
3 HND Computing: Technical Support (based on existing award)
4 HND Computing: Software Development (based on existing award)
5 HND Computing: Networking (based on HND Computer Internetworking)

This document will concentrate on defining the rationale, content and delivery of the HND Computer Science award.

1.2 Rationale

This new award has been designed to meet the growing needs of small to medium sized IT and computing related companies throughout the length and breadth of Scotland and the UK as a whole.

All four HND awards have been designed to contribute to an overall collective group of national awards which fully cover the complete spectrum of computing and IT within Scotland; from the more specialist/specific streams of Software Development and Networking to the broader streams of Computer Science and Technical Support.



Proposed position of new awards within the spectrum of SQA portfolio. Diagram illustrates possible overlaps of frameworks

As other Computing HND awards become more specialised, a skills and knowledge gap has emerged which lends itself to a national award which supports, not only the direct continuation of study from schools via the Curriculum for Excellence portfolio of subjects, but also prepares students for further study in tertiary education (SCQF level 9–11) whilst still supporting the historical need to prepare students for employment.

This qualification uniquely matches the skillsets required to meet the gap between software development and technical support. HND Computer Science does not aim to challenge the specialisms of the other three HND Computing related awards. Instead it aims to meet the challenges of accommodating employers who require well-qualified learners who can demonstrate competency in a wide variety of related skills; design and maintain a web site, carry out technical support, develop small scale stand alone and mobile applications and demonstrate the recognised soft skills required to work in small groups.

It is envisaged that colleges throughout Scotland will adopt this HND framework. The award offers centres an opportunity to provide an effective qualification which will not only meet the current and future needs of Computing, but is flexible enough to be tailored to meet local employment needs as well as local articulation agreements with universities and other HE establishments.

The qualification must ensure learners are given the opportunity to extend their studies. Articulation agreements will enable learners engaging in this award to continue onto higher educational establishments throughout Scotland. The list highlighted in Section 6.2.1 is neither definitive nor complete. However, it is intended to demonstrate a wide ranging support of this qualification from the HE sector.

This award has been designed to articulate to the HNC Computing award which was validated in December 2011. As the same members of Qualification Design Team (QDT) were involved in both awards the need to develop seamless and transparent transition between SCQF level 7 and level 8 was at the forefront of the QDT's minds.

The following table suggests the optional Units which should be taught in the HNC Computing to successfully progress onto the proposed second year of the HND Computer Science award.

HNC Computing ⇨ HND Computer Science	**SCQF level**	**Credit(s)**
All Mandatory HNC Computing Units (6 credits) plus		
SQL: Introduction	7	1
e-Commerce: Publishing Websites	7	2
Managing a Web Server	7	1
Database Design Fundamentals	7	1
Human Computer Interaction	7	1
Software Development: Developing Small Scale Standalone Applications	7	2
Computer Networking Fundamentals	7	1
Software Development: Applications Development	7	2

The HNC Computing is achievable with 12 credits; however, it is recommended that candidates wishing to progress to the HND should achieve 15 Units whilst studying for the HNC. The selection of these additional (3) credits is done at local or regional level.

1.3 Target Client Groups

The primary target groups for the HND Computer Science award are:

- School pupils who have gained two relevant new National Courses at Higher, based on the *Curriculum for Excellence*, together with three passes at National 5 level in appropriate subjects.
- Further education students who have completed their National Certificate in Digital Media Computing at SCQF level 5 or level 6 or a combination of both. It is suggested that learners gaining entry onto to the award with NC Digital Media Computing at SCQF level 5.
- Higher education learners completing the HNC Computing award vocational qualification with a view to progressing onto the second year of a national award to gain entry into university or seek employment.
- Unemployed adults who wish to retrain in this vocational field with a view to finding employment.
- Adults in employment who wish to change career either within the computing sector or those who wish to change careers totally.
- Adults wishing to gain a recognised national qualification as part of CPD requirements for their employer.

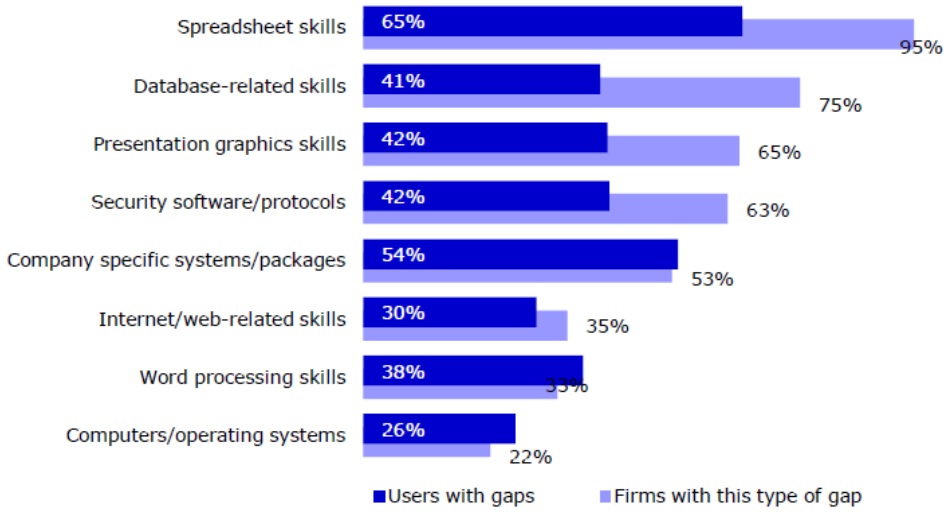
Specific entry requirements are given in Section 4 of the document.

It should be noted that all of these groups, irrespective of their reasons for undertaking this award, may have to progress to university due to the highly competitive nature of this employment sector and its preference for graduate entry.

This programme allows colleges to maintain an up-to-date recognised qualification within the context of an ever changing and volatile employment market. Although the core context of the award will remain constant the number of differing optional Units allows the centre to easily quickly undertake paradigm shifts from IT, to software development to technical support — where local demand requires it. Incorporation of Units such as cloud computing, convergence technologies, network technology and data communications and the inclusion of vendor qualifications all support this statement.

1.4 Employment Opportunities

1 The aim of this award is therefore to provide a skillset which will match the forecast (Technology Insights 2012, e-skills Scotland)



Source: National Skills Academy for IT — Employer survey, 2011

Results from 2011 employer surveys show around one in four (25%) employers in Scotland were aware of gaps in the skills of their employees.

The number of people working as IT Professionals in Scotland is forecast to continue growing strongly (2.4% per annum — nearly five times the national average) and this group of workers will account for 40% of all IT and Telecoms professionals in Scotland by 2020.

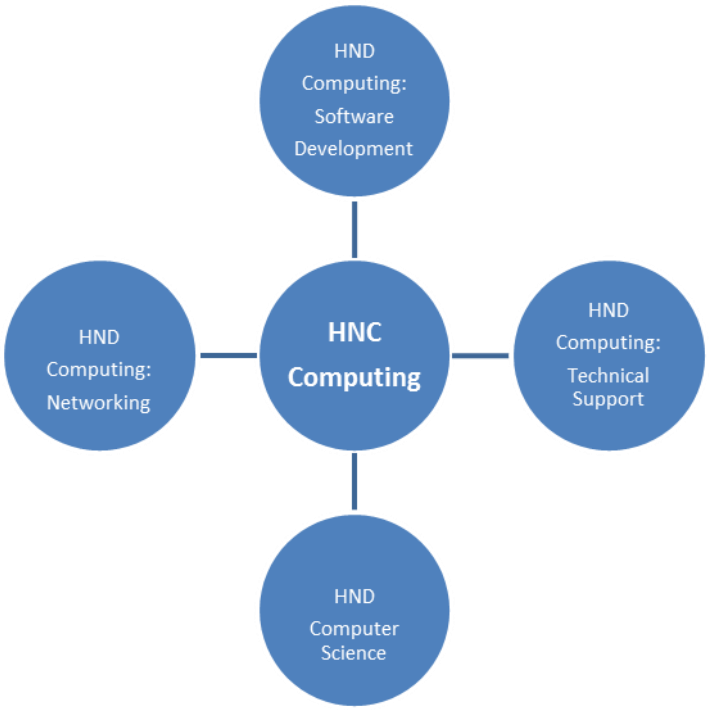
The technical skills most often sought by employers (in order of demand volume) were: SQL, NET, Java, C#, SQL Server, Oracle, ASP, JavaScript, Unix and Linux.

Specific technologies with important skills implications have been also identified and these include: Cloud Computing; Green IT; Social and Mobile Computing; 'Big data'/Analytics, Smart Computing and Security and Data Protection.

Software development, database management and technical support/networking themes can all be traced through this programme. The versatility in the range of optional Units allows the centre to customise the qualification to local needs — whilst the core Units maintain the intended Core Skills of the award.

1.5 Relationship with other awards

This award is part of a suite of new or revised HNDs awards, as explained in section 1.1. The relationship between the awards is illustrated in the diagram below.



The HNC award is embedded within all of the HNDs, and (largely) constitutes the first year of each programme. Each HND offers a particular specialism that reflects recognized vocational or academic progression paths (see Section 6.2 for further information on vocational or academic progression). The awards have similar structures and equivalent demands (in terms of practical or cognitive competencies) but each seeks to provide different skills sets and underpinning knowledge.

2 Qualification structure

This Group Award is made up of 30 SQA Unit credits. It comprises of 240 SCQF credit points of which 64 are at SCQF level 8 in the mandatory section including a HNC Computing Graded Unit 1 of 8 SCQF credit points at SCQF level 7 and a HND Computer Science Graded Unit 2 of 16 SCQF credit points at SCQF level 8. A mapping of Core Skills development opportunities is available in Section 5.3.

2.1 Structure

In order to achieve the HND Computer Science Group Award the candidate must achieve 14 mandatory credits and 16 optional credits from Groups 1, 2 and 3.

Please note if choosing Units from Group 2 only a maximum of 9 credits can be taken. If choosing from Group 3 only a maximum of 7 credits can be taken.

The mandatory section of this Group Award incorporates 64 SCQF credit points at SCQF level 8 which satisfies the design principles.

Mandatory Units — Total of 14 credits

Candidates must pass all of the following Units.

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Developing Software: Introduction	H173 34	8	7	1
Professionalism and Ethics in Computing	H1F7 34	8	7	1
Computer Systems Fundamentals	H175 34	8	7	1
Troubleshooting Computer Problems	H177 34	8	7	1
Team Working in Computing	H178 34	8	7	1
Computing: Graded Unit 1 (Exam)	H1J8 34	8	7	1
Relational Database Management Systems	H16W 35	16	8	2
Software Development: Developing Websites for Multiplatform Use	H1J9 35	16	8	2
Managing a Web Server	H16S 35	16	8	2
Computer Science: Graded Unit 2 (Project)	H48Y 35	16	8	2

It is envisaged that all mandatory SCQF level 7 Units will be taught within the pre-requisite HNC Computing/HND Computer Science (Year 1) qualification.

Optional Units — Total of 16 credits

Learners must select at least 16 credits selected from one or more of the following groups of optional Units.

Group 1: Specialist options (up to 16 credits)
Group 2: General options (up to 9 credits)
Group 3: Vendor Units (up to 7 credits)

These rules of combination ensure that the aims and objectives of the award are achieved, irrespective of the route through the award. For example, by limiting the general options to 9 credits, all candidates are required to complete at least 21 credits directly related to the subject area.

Group 1 specialist options should be seen as the non-mandatory credits which are fundamental to giving the Group Award its distinctive emphasis on software development. Group 2 general options give centres a degree of flexibility in course design, eg options to include mathematics, networking and hardware. Group 3 Units are dedicated vendor qualifications. See the following section for further information on vendor provision.

Note that a local option is included in Group 2 (general options). Up to four credits can be selected from any area, subject to the design rules and rules of combination defined above. This is consistent with the current awards and reflects the preferences of centres so that they can customize the awards to their local circumstances.

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Group 1 — Specialist Options (Up to 16 credits)				
Big Data*	H8W8 34	8	7	1
Data Science*	H8W9 35	16	8	2
Private Cloud Virtualisation*	H8N5 35	8	8	1
Open Source Operating Systems: Introduction to Command Line Administration	HT6W 35*	16	8	2
Cloud Computing	H179 34	7	8	1
SQL Introduction	DH3J 34	8	7	1
Database Design Fundamentals	DV6E 34	8	7	1
E-Commerce: Publishing Web Sites	DV6G 34	16	7	2
Developing Mobile Web Based Applications: An Introduction	HF4Y 34*	16	7	2
Web Development: Dynamically Generated Content	HF57 35*	16	8	2
Managing a Web Server	H17P 34	8	7	1
Software Development: Applications Development	D76N 34	16	7	2
Software Development: Developing Small Scale Standalone Applications	H17W 34	16	7	2
Software Development: Object Oriented Programming	H171 35	16	8	2
Software Development: Programming Foundations	H17X 34	8	7	1
Human Computer Interaction	H17L 34	8	7	1
Mobile Technology	H17R 35	8	8	1
Computing: PC Hardware and Operating System Essentials	H17E 34	8	7	1
Computing: PC Hardware and Operating System Support	H17F 34	8	7	1
Client Operating Systems	H1EM 34	16	7	2
Computing: Introduction to Project Management	H17D 34	8	7	1
Systems Development: Testing Software	H181 34	8	7	1
Systems Development: User Centred Design	H182 34	8	7	1
User Interface Design	HF55 34*	8	7	1
Software Development: Object Oriented Analysis and Design	H172 35	16	8	2
Computer Networking: Fundamentals	H17A 34	8	7	1
Computer Networking: Practical	H17B 34	8	7	1
Mathematics for Computing 1	D76E 34	8	7	1
Systems Development: Introduction	H180 34	8	7	1
Software Development: Data Structures	H16Y 35	16	8	2

Artificial Intelligence	HT9T 34*	8	7	1
Computer Architecture	J0J8 34*	8	7	1
Computer Operating Systems	J11V 34*	8	7	1
Computer Operating Systems	J11W 35*	16	8	2
Computing Programming	J0HA 34*	8	7	1
Emerging Technologies & Experiences	HF85 34*	8	7	1
Firewall Essentials	J2JW 34*	16	7	2
Internet of Things	J0HC 34*	8	7	1
Machine Learning	J0J9 34*	8	7	1
Machine Learning	J1BB 35*	16	8	2
Robotics: Fundamentals	J11T 34*	8	7	1
Data Security	J0H9 34*	8	7	1
Data Flow	J27L34*	8	7	1
Cryptography: Practical Applications	J4BF 34*	8	7	1
Programming for Data	J4YB 35*	8	8	1
Machine Learning	J4YD 36*	16	9	2
Website Design, Multimedia Content Creation	FW5D 34*	8	7	1

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Group 2 — General Options (Up to 9 credits)				
Using Software Applications Packages*	D85F 34	8	7	1
Information Technology: Applications Software 1*	D75X 34	8	7	1
Computing: Planning*	DH35 34	8	7	1
Configuring a Desktop Operating System	FK89 34	16	7	2
Managing a Desktop Operating System Deployment	FK88 35	16	8	2
Network Technology and Data Communications	H16V 35	16	8	2
Artificial Intelligence for Computer Games*	HH3D 35	16	8	2
Entrepreneurship in the Creative Industries	DR0T 35	8	8	1
Technical Support: Supporting Users – Hardware	H183 34	8	7	1
Technical Support: Supporting Users - Software	H184 34	8	7	1
Building an e-Business	F6JJ 34	8	7	1
Computer Networks: Building Local Area Networks	H17C 34	16	7	2
Multi User Operating Systems	DH3A 34	8	7	1
Troubleshooting a Desktop Operating System	FK8A 34	16	7	2
Databases: Introduction	H17H 34	8	7	1
Convergence Technologies	H17G 35	16	8	2
Digital Culture: Online Collaboration	F86V 35	8	8	1
Digital Culture: Online Communications	F86P 34	8	7	1
Software Development: Systems Foundations	H17Y 34	16	7	2
Computer Hardware: Hardware Installation and Maintenance	H1FY 34	16	7	2
Digital Culture: Web 2.0 Applications	F86T 33	8	6	1
*Ethical Hacking	J0HK 34	8	7	1
*Preparing to Start a Business	H7V4 34	8	7	1
Handling Information as a Resource	H17K 34	8	7	1
Intrusion Prevention Systems	H17M 34	8	7	1
Information Technology: Information Systems and Services	H1G0 34	8	7	1
Mail Server Management	H17N 34	8	7	1
Mathematics for Computing	A5P0 35	8	8	1
Mathematics for Computing 2	D76F 35	8	8	1
Mathematics for Interactive Computing: Essential Techniques	F20B 34	8	8	1
Mathematics: Calculus and Matrices for Computing	DP8F 34	8	7	1

* Refer to History of Changes for revision changes.

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Group 2 — General Options (Up to 9 credits)				
Multimedia: Developing Multimedia Applications	DH2R 34	16	7	2
Network Concepts	H17S 34	16	7	2
Personal Development Planning	DE3R 34	8	7	1
Project Management for IT	F1W0 34	8	7	1
Providing Support to Users	H17T 34	8	7	1
Network Security Concepts	HT9G 34*	16	7	2
Work Role Effectiveness	DG6E 34	24	7	3
Work Role Effectiveness	DG6G 35	24	8	3
Working in IT	H185 35	16	8	2
Workplace Communication in English	H8T2 33*	8	6	1
Bring Your Own Device (BYOD): Introduction	H6D0 34*	8	7	1
Digital Skills	H9DE 34*	8	7	1
Digital Forensics	J0HL 34*	8	7	1
Group 3 — 'Vendor' Options (Up to 7 credits)				
Technical Specialist: Web Applications Development with Microsoft.NET Framework 4	H1HP 35	30	8	3.5
Technical Specialist: Windows Communication Foundation Development with Microsoft.NET Framework 4	H1HS 36	9	9	1
Technical Specialist: Windows Applications Development with Microsoft.NET Framework 4	H1HT 36	15	9	1.5
Technical Specialist: Accessing Data with Microsoft.NET Framework 4	H1HV 35	15	8	1.5
Technical Specialist: Microsoft SharePoint 2010, Application Development	H1HW 36	15	9	1.5
Database Design and Programming in SQL	H4KJ 34*	15	7	1.5
Database Programming with PL/SQL	H4KP 35*	15	8	1.5
Group 4 — Local Option (Up to 4 credits permitted)				
Web Development Fundamentals	F203 34	8	7	1
Routing Technology	FR22 35	16	8	2
Networking Technology	FR24 35	16	8	2
Computer Operating Systems 2	DM2X 35	8	8	1
Professional Career Development in the IT Industry	HG1K 34	8	7	1
Big Data	H8W8 34	8	7	1
Self Describing Data (XML)	FM97 35*	8	8	1
Web Development: Essential Content	HF58 34*	16	7	2

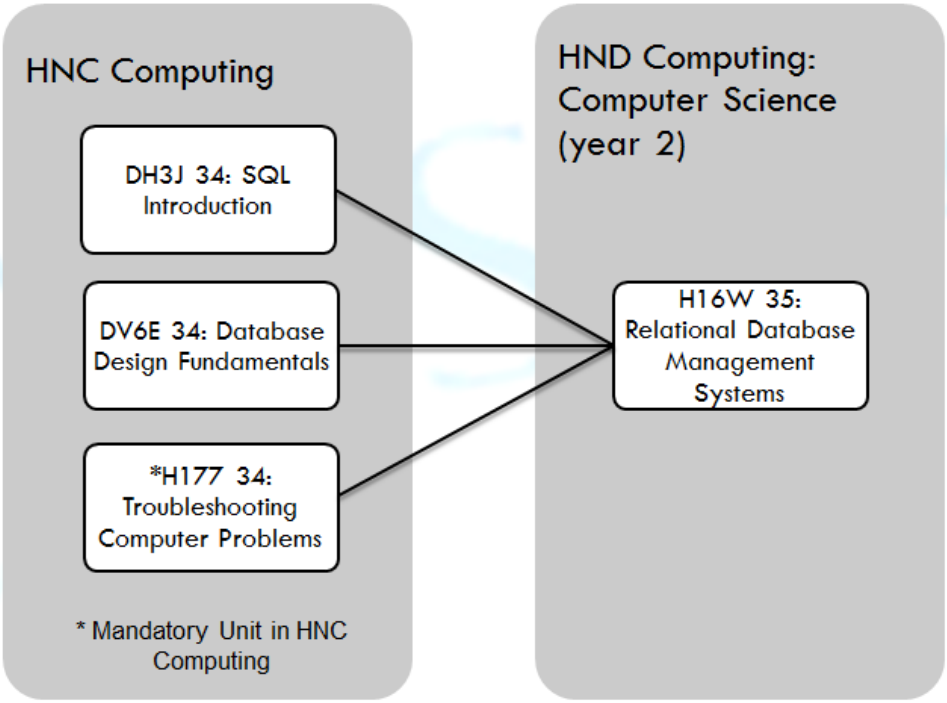
*Refer to History of Changes for revision changes.

Mapping of Units from HNC Computing/HND Computer Science, Year 1 which provide underpinning knowledge and skills for each core Unit within second year HND Computer Science

Core Unit — H16W 35: *Relational Database Management Systems*

Knowledge Outcomes

- Identify and use the processes and terminology used in designing a RDBMS.
- Design a RDBMS from a given scenario.
- Map the design model to the physical model.
- Create and run SQL statements/queries on a RDBMS.



DH3J 34 SQL: Introduction
Specific knowledge Outcomes related to core module

- Create and maintain a data storage system.
- Manipulate data stored within a table structure.

DV6E 34 Database Design Fundamentals
Specific knowledge Outcomes related to core module

- Create a normalised relational database structure.
- Write SQL select statements to maintain and update a database structure.
- To interrogate the database and manipulate the data.

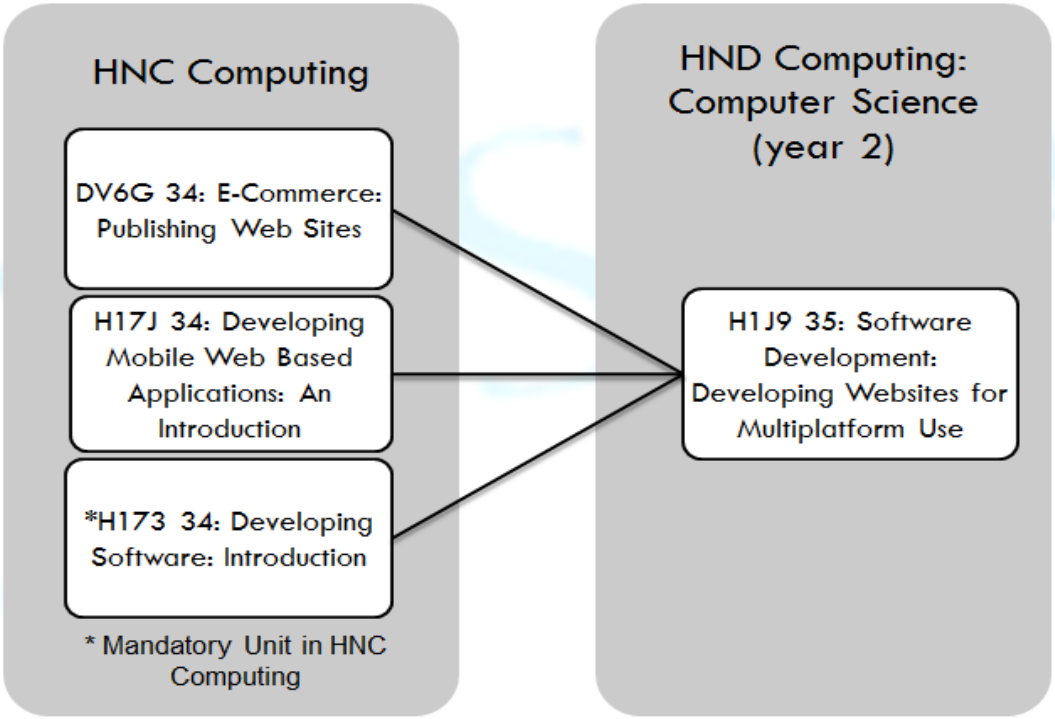
H177 34 Troubleshooting Computing Problems
Specific knowledge Outcomes related to core module

- Investigate a computing problem.
- Plan and implement a solution to a computing problem.
- Document the steps taken to resolve a computing problem.

Core Unit — H1J9 35: Software Development: Developing Websites for Multiplatform Use

Knowledge Outcomes

- Describe the scripting features used in the development of websites.
- Design a website for a specific device using the principles of software planning and design.
- Use appropriate tools and techniques to optimise websites developed for a specific device.
- Utilise server-side scripting including database processing of requests submitted from a specific device.



DV6G 34 e-commerce: Publishing Websites
Specific knowledge Outcomes related to core module

- Create a database structure for an e-commerce website.
- Design and implement a user interface for an e-commerce website.
- Utilise a server-side scripting language to provide site security, database interrogation and user feedback.

H17J 34 Developing Mobile Web Based Applications: An Introduction
Specific knowledge Outcomes related to core module

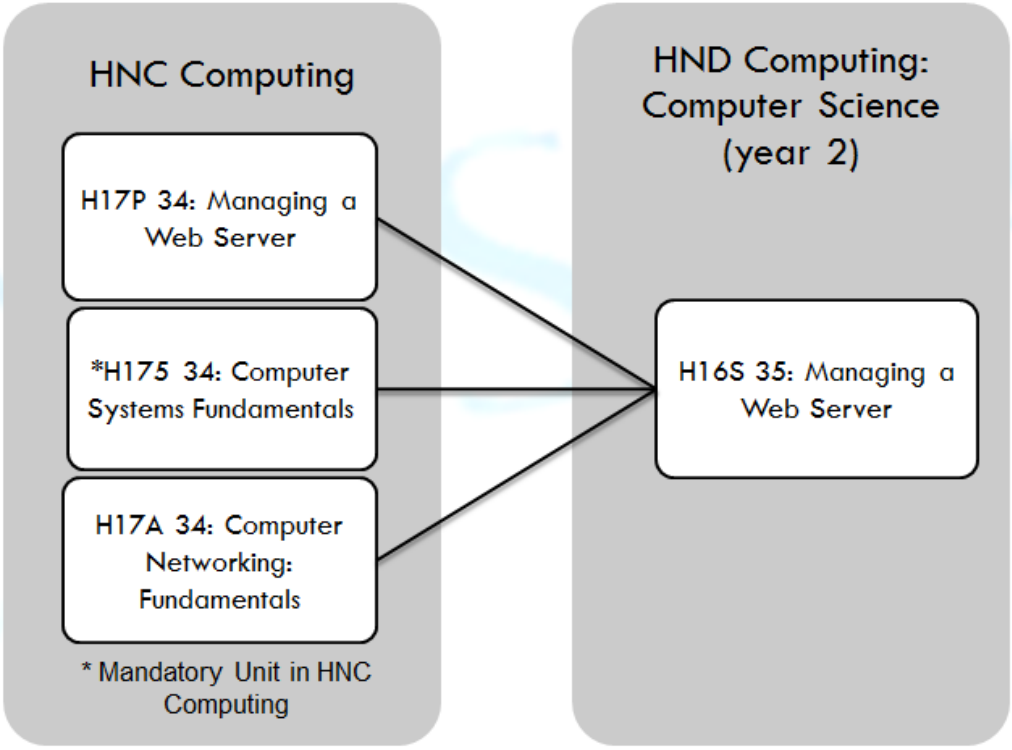
- Describe the features of the target device and industry structure that can affect the production of mobile web based applications.
- Design a solution for a mobile web based application.
- Develop a solution for a mobile web based application.

H173 34 Developing Software: Introduction
Specific knowledge Outcomes related to core module

- Implement and test code to carry out tasks following a given design.
- Prepare technical documentation in line with good practice

H16S 35 Managing a Web Server
Knowledge Outcomes

- Analyse and evaluate the requirements for running a web server.
- Install and configure a web server.
- Perform web server maintenance.
- Implement web server security.



H17P 34 Managing a Web Server
Specific knowledge Outcomes related to core module

- Analyse the requirements for setting up and maintaining a new Web Site.
- Install and set up a web server for the new Web Site.

H175 34 Computer Systems Fundamentals
Specific knowledge Outcomes related to core module

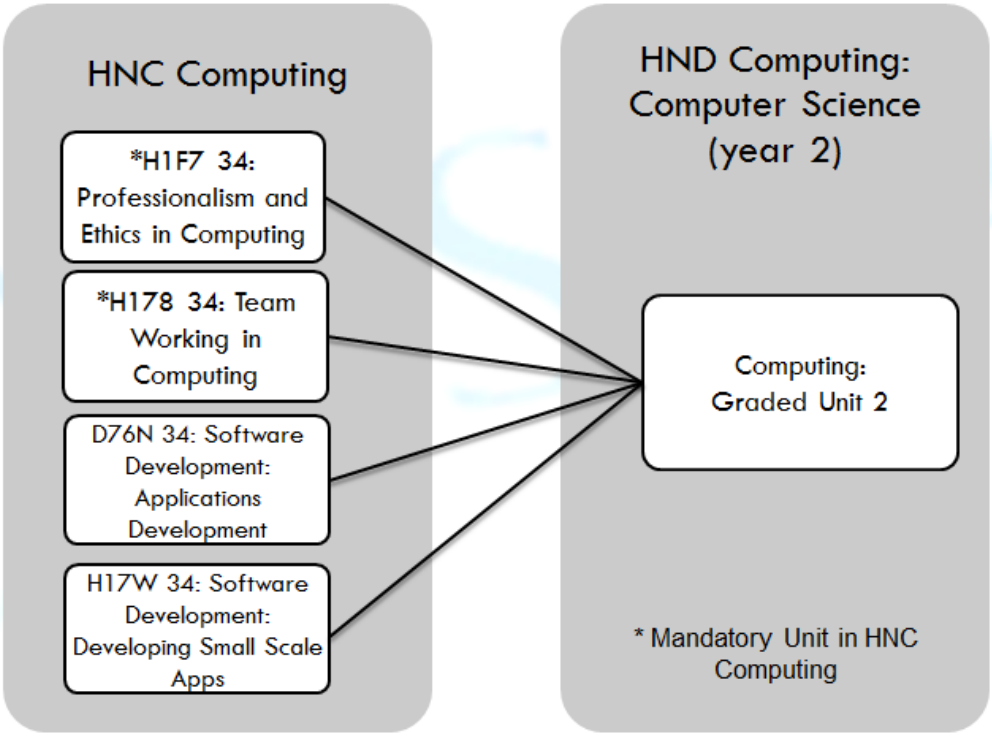
- Install a range of computer software.

H17A 34 Computer Networking: Fundamentals
Specific knowledge Outcomes related to core module

- Describe the elements and characteristics of contemporary computer networks.
- Describe the OSI model and the TCP/IP protocol suite.
- Describe a range of WAN technologies.

Computing: Graded Unit 2
Knowledge Outcomes

- Prepare for employment in an IT/Computing-related post at technical or professional level in application/web development, technical or support.
- Develop a range of contemporary vocational skills, ie technical computing skills relating to the use and support of IT.



H1F7 34 Professionalism and Ethics in Computing
Specific knowledge Outcomes related to core module

- Apply codes of conduct and ethical standards relevant to computing practitioners.
- Describe contemporary legislation as it relates to computing practitioners.
- Evaluate ethical considerations in a relevant vocational context.

H178 34 Team Working in Computing
Specific knowledge Outcomes related to core module

- Effectively participate in planning and organising a co-operative ICT project.
- Participate in the management of a co-operative ICT project and research and carry out agreed project tasks against the schedule and within the remit of the project role.
- Review own and group skills demonstrated throughout the co-operative ICT project.

D76N 34 Software Development: Applications Development
Specific knowledge Outcomes related to core module

- Analyse user requirements for creating an automated application interface.
- Produce an automated interface for use with an application software package.
- Carry out validation of data entry on automated procedures.
- Document the automated procedures.

H17W 34 Software Development: Developing Small Scale Standalone Applications
Specific knowledge Outcomes related to core module

- Design a small standalone interactive application.
- Construct a small standalone interactive application.
- Test and deploy a small standalone interactive application.

The SCQF level Descriptors have five characteristics which provide a reference point for determining the level of a qualification, learning programme, module or Unit of learning or for the recognition of prior learning. They are not intended to give precise or comprehensive statements of required learning for individual qualifications.

Each level is described in terms of its characteristic general Outcomes under five broad headings.

These are:

- Knowledge and understanding — mainly subject-based
- Practice (applied knowledge and understanding)
- Generic cognitive skills — eg evaluation, critical analysis
- Communication, numeracy and IT skills
- Autonomy, accountability and working with others

All of the core HND Computer Science SCQF level 8 Units have corresponding underpinning SCQF level 7 Units. Competency at SCQF level 8 can be evidenced throughout the core Units.

Relational Database Management Systems (H16W 35) and *Software Development: Developing Websites for Multiplatform Use* (H1J9 35) provided a platform to demonstrate a range of routine skills, techniques, practices and/or materials associated with website development involving advanced or complex programming techniques.

All core SCQF level 8 Units will involve the learner carrying out routine lines of enquiry, development or investigation into professional level problems and issues.

The *HND Computer Science Graded Unit 2* contributes heavily to at least two of the five headings. Above all individual learners will undertake critical analysis, evaluation and/or synthesis of ideas, concepts, information and issues within the context of a realistic project. To achieve a workable solution the learner will need to use a range of approaches to formulate evidence-based solutions/responses to defined and/or routine problems/issues. Finally the learner will need to critically evaluate both the process and the product.

2.2 Inclusion of vendor qualifications within HND Computer Science

SQA has agreed to participate in a pilot project to evaluate the feasibility of directly accrediting vendor qualifications within this award. This pilot has the approval of SQA's Qualification Committee, chaired by the Director for Qualifications.

Previously, vendor qualifications were accredited through credit transfer, whereby shadow Units were created, based on vendor curricula, and candidates were awarded these [SQA] Units on the basis of their vendor achievements. However, this system placed the onus on SQA to revise these shadow Units whenever vendors changed their certifications.
The pilot programme places the responsibility for recognition on to the vendors. Vendors are required to credit and level their qualifications using SCQF, and then propose these awards for inclusion in this framework. Their inclusion, or otherwise, will be decided by the appropriate Qualifications Support Team.[1] Figure 2 illustrates the process of vendor accreditation.

[1] During the development phase, the QDT will decide on the inclusion of specific vendor qualifications. This task will be taken over by the QST once the award is operationalised.

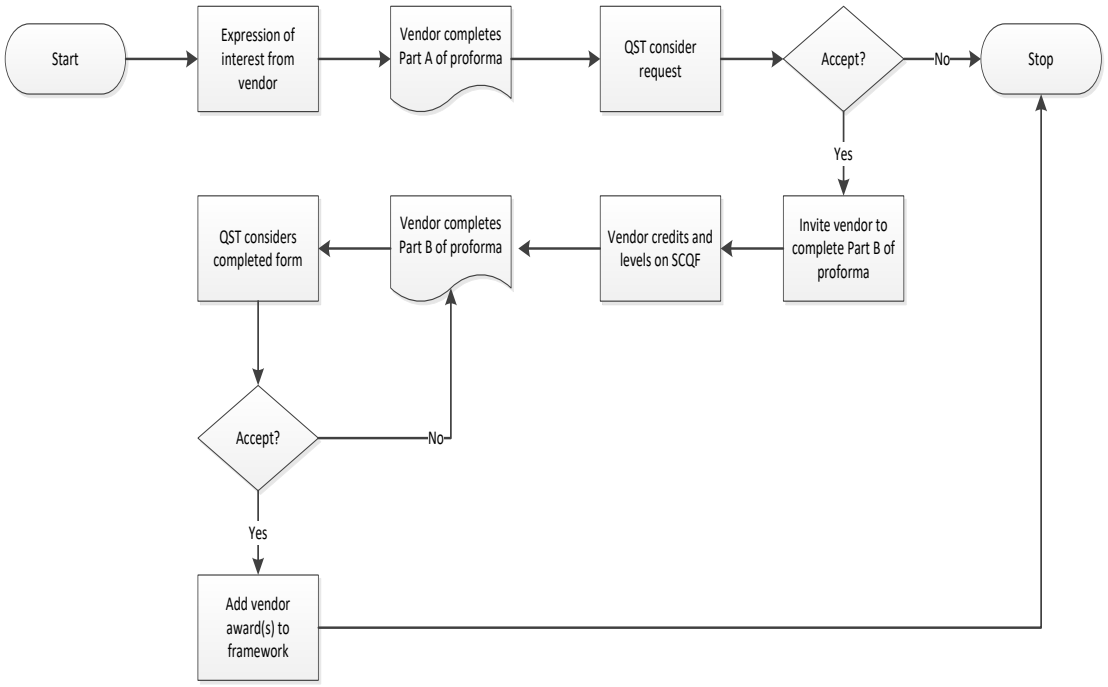


Figure 1: Vendor accreditation process

The Qualifications Committee imposed a cap on the contribution of vendor awards to national qualifications. The cap is 25% (seven credits for an HND). This limit applies to all vocational qualifications with direct recognition of third party awards, based on SCQF. This rule will be reviewed when the pilot is evaluated.

It is the responsibility of each vendor to accredit their awards on SCQF. This may be done by any one of the SCQF—accreditation bodies in Scotland.

Grouping 3 within the qualification structure shows the accredited vendor qualifications at the time of writing this document. It is anticipated that more vendor awards will be added as and when they are accredited through this process. When a specific vendor award is accredited but found to be similar to an existing (generic) HN Unit, these Units (the vendor Unit and the HN Unit) will be grouped into an excluded combination to ensure that candidates cannot double count their knowledge or skills.

All decisions regarding the accreditation of vendor Units (for inclusion in this framework) and excluded combinations will be made by the Qualifications Support Team for HN awards.

This pilot programme will be evaluated in summer 2013, when final decisions will be made regarding its continuation.

3 Aims of the qualification

The principle aim of this award is to reflect the increasing need to provide, for the information and communication technologies sector and the Scottish tertiary education sector, a student who can demonstrate a high proficiency in the areas of web development, software development and technical support which will enable them to thrive in today's global digital economy.

The title of the award is HND Computer Science. This title was chosen for several reasons including:

- continuity with newly validated HNC Computing award
- accurate summary of the contents of the revised award
- stakeholder support for this title

'HNC Computing' has been offered by SQA since 1978 and has, therefore, established a considerable reputation during that time. The revised HNC was designed to combine the competences of two existing HNCs (HNC Computing and HNC Computer Networking) and, as such, covers a broad range of computer-related knowledge and skills.

The HND Computer Science was designed to extend theses competences correspond to those characterised by the SCQF and its Scotland's Lifelong Learning Framework which was developed in 2001 to meet the needs of Scotland's learners and provides a shared context for learning in Scotland. It was created by bringing together all Scottish mainstream qualifications into a single unified Framework.

There was overwhelming stakeholder support for this title, with over 72% of all stakeholders supporting this title.

Progression to degree courses is particularly important for students who undertake this award due to the high number of students who progress from the HND to degree programmes.

The following aims were supported by all stakeholders (72%). The Sector Panel (which includes a significant number of employers) also supported the aims.

3.1 General aims of the qualification

The general aims of this award are:

1 To develop candidates' knowledge and skills in planning, developing and evaluating.
2 To develop employment skills, particularly relating to the IT industry.
3 To enable progression to further studies within the Scottish Credit and Qualifications Framework.
4 To develop and support study and research skills.
5 To develop strategies for learning and encourage transferable skills.
6 To provide academic stimulus.
7 To support learners' continuing professional development.

3.2 Specific aims of the qualification

The specific aims of this award are:

8 To develop an awareness of current professional practices and technologies within the domain of computer science.
9 To develop a range of specialist knowledge and skills that reflects recent, in-demand developments in applications developments, web and mobile programming and database developments.
10 Where applicable, to provide learners with a range of underpinning knowledge that is supported by a wide range of vendors.
11 To offer articulation routes to a range of university degree programmes by developing scholarly activities and an independent learning environment.
12 To offer flexibility with the themes of Units across a range of computer science related areas.

3.3 Graded Unit

A project was selected as the Graded Unit by the QDT rather than an examination. This was chosen for several reasons, including:

- Continuity: HND frameworks have used an examination since the inception of Graded Units in 2003.
- QDT Preference: The QDT supported the use of project for HND Computer Science.
- Stakeholder Support: Heads of Computing supported the use of an project.
- HE Articulation: a project facilitates progression to degree courses as it supports both scholarly activities and independent learning. It was also supported by HE in our consultations.
- Employer Preference: employers expressed a preference for a project as it allows the learner to gain familiarity scenarios simulating real-life experiences.

The Graded Unit for this award is designed to provide evidence that the candidate has achieved the following principal aims of HND Computer Science:

- To develop the candidate's knowledge and skills such as planning, analysing and problem solving.
- To develop study and research skills.
- To prepare students for progression to further study in computing or a related discipline.
- To provide the learner with the opportunity to develop the identified Core Skills within the context of a real project with external clients.

The SCQF level 8 Graded Unit is designed to evidence candidate's ability to plan, develop, implement and evaluate technical skills gained throughout their course. It does not ask the candidates to prove new skills but these would be developed as the student would be expected to carry out independent scholarly activities such as further development of a taught programming language, development of new skills and research capabilities.
It will be project-based and will allow the candidate the flexibility to select from a variety of different projects which are representative of the skills expected of a student undertaking this qualification, eg the practical implementation of a software deployment project for a small to medium sized company, producing a report/feasibility study on the implementation of IT systems for an organisation, or setting up a web or mobile based application.

4 Recommended entry to the qualification

Entry to this qualification is at the discretion of the centre. The following information on prior knowledge, skills, experience or qualifications that provide suitable preparation for this qualification has been provided by the Qualification Design Team as guidance only.

Learners would benefit from having attained the skills, knowledge and understanding required by one or more of the following qualifications and/or experience.

- Passes in two relevant National Courses at SCQF level 6 (Higher) together with three relevant subjects at National 5.
- A related National Certificate at SCQF level 6.
- A relevant combination of vocational awards at appropriate levels.
- A mix of the above.

For example, a school leaver may be expected to possess two Higher level passes, (such as Computer Science and English) together with three passes at National 5 (such as Mathematics, Business Administration and History).

A college entrant would be expected to have completed a relevant National Certificate programme such as Digital Media Computing at SCQF level 6 or Computer Games Development at SCQF level 6. A combination of level 6 and level 5 National Units would also be appropriate. For example, a college entrant may possess a National Certificate in Mobile Technology at SCQF level 5 together with individual Unit passes at SCQF level 6.

Given the range of vocational awards available to learners, applicants who possess a range of smaller vocational qualifications should also be considered. For example, possession of relevant National Progression Awards (such as PC Passport and Computer Games Development at SCQF level 6) may be considered appropriate for entry to this award.

Applicants with a mixture of the above should also be considered for entry. For example, a candidate who possessed a pass in Computer Science at SCQF level 6 (Higher) together with one or more relevant NPA awards at SCQF levels 5 or 6 would, most likely, have the necessary knowledge and skills to benefit from undertaking this award.

Equivalent qualifications from other awarding bodies may also be acceptable as would suitable vendor certifications.

Mature candidates with suitable work experience should also be considered subject to the Core Skill entry profile detailed in Section 4.1.

For direct entry into Year 2 of the HND learners should have successfully passed HNC Computing (2012 version). While success at HNC Computing necessitates passing only 12 credits including the mandatory Units, it's recommended that learners achieve 15 credits before moving onto Year 2 of the HND. The selection of the three additional credits should be done at a local level.

Recommended optional Units level 7 Units which may be useful for advancing into the second year of HND Computer Science include;

DV6E 34 *Database Design Fundamentals*
H17J 34 *Developing Mobile Web Based Applications: An Introduction*
D76N 34 *Software Development: Applications Development*
DV6G 34 *E-Commerce: Publishing Web Sites*
DH3J 34 *SQL: Introduction*
H17W 34 *Software Development: Developing Small Standalone Applications*
H17J 34 *Developing Mobile Web Based Applications: An Introduction*
H17P 34 *Managing a Web Server*

Centres should be aware that learners wishing to gain direct entry onto to the second year of the award must apply for credit transfer using the recognised SQA quality procedures to ensure that the learner is credited with the appropriate SCQF level 7 Units to gain the named award.

4.1 Core Skills entry and exit profile

The Core Skill entry profile provides a summary of the associated assessment activities that exemplify why a particular level has been recommended for this qualification. The information would be used to identify if additional learning support needs to be put in place for learners whose Core Skills profile is below the recommended entry level or whether learners should be encouraged to do an alternative level or learning programme.

Core Skill	Recommended SCQF entry level	Associated assessment activities	SCQF exit level
Communication	Intermediate 2 (SCQF 5)	The Core Skill of 'Communications' at SCQF level 6 can be developed comfortably and naturally within the mandatory Units Team Working in Computing and Professionalism and Ethics in Computing but have been signposted rather than embedded.	Higher (SCQF 6)
Numeracy	Intermediate 2 (SCQF 5)	The Qualification Design Team have embedded the Core Skill of 'Numeracy' at SCQF level 5 within the mandatory Unit Computer Systems Fundamentals. A selection of 'Mathematics' Units which have Numeracy embedded at SCQF level 6 are also included in the framework as optional Units for centres wishing to offer a higher Core Skill exit level (refer to end of Section 4.1 for more information).	Intermediate 2 (SCQF 5)
Information and Communication Technology	Intermediate 2 (SCQF 5)	The Core Skill of 'ICT' at SCQF level 6 is embedded in the mandatory Unit Team Working in Computing.	Higher (SCQF 6)
Problem Solving	Intermediate 2 (SCQF 5)	The Core Skill component of 'Critical Thinking' which is part of the Problem Solving Core Skill is embedded within the mandatory Unit of Developing Software: Introduction. The Core Skill of 'Problem Solving' at SCQF level 6 is embedded in the mandatory Unit Troubleshooting Computing Problems.	Higher (SCQF 6)
Working with Others	Intermediate 2 (SCQF 5)	The Core Skill of 'Working with Others' at SCQF level 6 is embedded in the mandatory Unit Team Working in Computing.	Higher (SCQF 6)

Core Skills can be embedded or signposted within Units**.** Embedded are where the development of a Core Skill is incorporated into the Unit and where the Unit assessment also covers the requirements of Core Skill assessment at a particular level. Units that have embedded Core Skill(s) will be automatically certificated upon successful completion of the Unit assessments.

Signposted means identifying opportunities within the Unit for developing Core Skills other than those that can be summatively assessed and certificated. This allows the development of the Core Skills through teaching and learning to be utilised and these opportunities are highlighted within the Unit support notes to those delivering and managing the Units.

Additional opportunities to attain the Core Skill of Numeracy at a higher SCQF level exist in the following Units:

DP8F 34 *Mathematics: Calculus and Matrices for Computing* (embedded — SCQF level 6)

D76E 34 *Mathematics for Computing 1* (Using Number embedded — SCQF level 6, Using Graphical Information embedded — SCQF level 5)

F20B 34 *Mathematics for Interactive Computing: Essential Techniques* (signposted — SCQF level 6)

4.2 Relationship with Curriculum for Excellence

The development encompasses the principles of CfE, particularly the principles relating to breadth, progression, choice and relevance.

As stated in the Higher Computing Science Course Specification.

The aims of the Course are to enable learners to:

- develop and apply aspects of computational thinking in a range of contemporary contexts
- extend and apply knowledge and understanding of advanced concepts and processes in computing science
- apply skills and knowledge in analysis, design, implementation and evaluation to a range of digital solutions with some complex aspects
- communicate advanced computing concepts and explain computational behaviour clearly and concisely, using appropriate terminology
- develop awareness of current trends in computing technologies and their impact in transforming and influencing our environment and society

All of these aims are mirrored, extended and developed within the HND Computer Science award.

5 Additional benefits of the qualification in meeting employer needs

This qualification was designed to meet a specific purpose and what follows are details on how that purpose has been met through mapping of the Units to the aims of the qualification. Through meeting the aims, additional value has been achieved by linking the Unit standards with those defined in National Occupational Standards and/or trade/professional body requirements. In addition, significant opportunities exist for learners to develop the more generic skills, known as Core Skills through doing this qualification.

5.1 Mapping of qualification aims to Units

To ensure that the aims of the national qualification are met, the QDT have ensured that all specific aims are covered by the core Units defined in the award. Optional Units will however play pivotal roles in the extending the learner's depth of understanding with reference to specific aims.

1 To develop candidates' knowledge and skills in planning, developing and evaluating.
2 To develop employment skills, particularly relating to the IT industry.
3 To enable progression to further studies.
4 To develop and support study and research skills.
5 To develop strategies for learning and transferable skills.
6 To provide academic stimulus.
7 To support learners' continuing professional development.
8 To develop an awareness of current professional practices and technologies within the domain of computer science.
9 To develop a range of specialist knowledge and skills that reflects recent, in-demand developments in applications developments, web and mobile programming and database developments.
10 Where applicable, to provide learners with a range of underpinning knowledge that is supported by a wide range of vendors.
11 To offer articulation routes to a range of university degree programmes by developing scholarly activities and an independent learning environment.
12 To offer flexibility with the themes of Units across a range of computer science related areas.

Unit title and code	Aims											
	1	2	3	4	5	6	7	8	9	10	11	12
Developing Software: Introduction (H173 34)	✓	✓	✓	✓		✓	✓	✓	✓	✓		
Professionalism and Ethics in Computing (H1F7 34)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Computer Systems Fundamentals (H175 34)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Troubleshooting Computer Problems (H177 34)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Team Working in Computing (H178 34)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Computing: Graded Unit 1: Exam (H1J8 34)			✓	✓		✓		✓				
Relational Database Management Systems (H16W 35)		✓		✓		✓	✓	✓	✓	✓	✓	✓
Software Development: Developing Websites for Multiplatform Use (H1J9 35)		✓		✓		✓	✓	✓	✓		✓	✓
Managing a Web Server (H16S 35)		✓		✓		✓	✓	✓	✓	✓		✓
Computer Science: Graded Unit 2: Project (H48Y 35)		✓		✓	✓	✓	✓	✓			✓	✓

5.2 Mapping of National Occupational Standards (NOS) and/or trade body standards

IT and Telecoms Professional National Occupational Standards (NOS) have been developed in parallel with and as part of the IT Professional Competency Model — e-skills Procom. E-skills Procom is being established as the industry recognised, internationally relevant training framework for organising courses and qualifications. It defines knowledge, understanding, and competencies for seven broad disciplines.

The disciplines are:

1 Sales and marketing
2 Business change
3 Programme and project management
4 Solutions architecture
5 Solution development and implementation
6 Information management and security

The content of disciplines 1–3, while important to the IT&T sectors, do not fall within the scope of e-skills UK for NOS. Consequently these will not formally be recognised as NOS as is the case for disciplines 4–6. To maintain the relationship these NOS have been numbered to reflect the relationship to e-skills Procom. Within each discipline there exist a number of sub-disciplines. Within each sub-discipline the competences relating to a particular role have been defined.

This is an example of a structure and as there are many more optional Units available then this is not an exhaustive list.

4.1 Systems Architecture
4.2 Data Analysis
4.3 Human Needs Analysis
4.4 Systems Analysis
4.5 Data Design
4.6 Human Computer Interaction/ Interface design
4.7 Systems Design
4.8 IT/Technology Infrastructure Design and Planning

5.1 Systems Development
5.2 Software Development
5.3 IT/Technology Solution testing
5.4 Systems Integration
5.5 IT/Technology systems installation, implementation and handover
6.1 Information management
6.2 IT Security management
6.3 IT Disaster Recovery

	Unit title and code	National Occupational Standards															
		4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	5.1	5.2	5.3	5.4	5.5	6.1	6.2	6.3
HND Computer Science (Year 1)	Developing Software: Introduction H173 34		✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
	Professionalism and Ethics in Computing H1F7 34														✓	✓	
	Computer Systems Fundamentals H175 34	✓					✓			✓		✓		✓			
	Troubleshooting Computer Problems H177 34	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Computing: Graded Unit 1 H1J8 34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Team Working in Computing H178 34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HND Computer Science (Year 2)	Relational Database Management Systems H16W 35		✓			✓	✓				✓	✓					
	Software Development: Developing Websites for Multiplatform Use H1J9 35				✓	✓	✓	✓			✓	✓		✓			
	Managing a Web Server H16S 35							✓		✓	✓		✓			✓	
	Computer Science: Graded Unit 2: Project (H48Y 35)		✓			✓	✓		✓	✓	✓	✓					

5.3 Mapping of Core Skills development opportunities across the qualification(s)

Unit code	Unit title	Communication		Numeracy		I CT		Problem Solving			Working with Others	
		Written	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/ Creating information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
H173 34	Developing Software: Introduction							Embedded (SCQF 6)				
H178 34	Team Working in Computing	Signposted (SCQF 6)	Signposted (SCQF 6)			Embedded (SCQF 6)	Embedded (SCQF 6)				Embedded (SCQF 6)	Embedded (SCQF 6)
H177 34	Troubleshooting Computing Problems							Embedded (SCQF 6)	Embedded (SCQF 6)	Embedded (SCQF 6)		
H175 34	Computer Systems Fundamentals			Embedded (SCQF 5)	Embedded (SCQF 5)							
H1F7 34	Professionalism and Ethics in Computing	Signposted (SCQF 6)	Signposted (SCQF 6)			Signposted (SCQF 6)	Signposted (SCQF 6)					
H16W 35	Relational Database Management Systems					Signposted (SCQF 6)	Signposted (SCQF 6)	Signposted (SCQF 6)	Signposted (SCQF 6)	Signposted (SCQF 6)		
H1J9 35	Software Development: Developing Websites for Multiplatform Use	Signposted (SCQF 6)	Signposted (SCQF 6)			Signposted (SCQF 6)	Signposted (SCQF 6)	Signposted (SCQF 6)	Signposted (SCQF 6)	Signposted (SCQF 6)		
H16S 35	Managing a Web Server					Signposted (SCQF 6)	Signposted (SCQF 6)	Signposted (SCQF 6)	Signposted (SCQF 6)	Signposted (SCQF 6)		
H48Y 35	Computer Science: Graded Unit 2: Project							Embedded (SCQF 6)	Embedded (SCQF 6)	Embedded (SCQF 6)		
J4YB 35	Programming for Data							Embedded (SCQF 6)	Embedded (SCQF 6)	Embedded (SCQF 6)		

5.4 Assessment Strategy for the qualification(s)

The Units listed below are the mandatory Units which when added to the mandatory HNC Computing Units form the 14 mandatory credits for the HND Computer Science award.

<table>
<tr><th>Unit</th><th colspan="4">Assessment</th></tr>
<tr><td rowspan="2">Relational Database Management Systems
(H16W 35)</td><td>Outcome 1</td><td>Outcome 2</td><td>Outcome 3</td><td>Outcome 4</td></tr>
<tr><td>Closed-book assessment: candidates will provide evidence by completing 20 multiple-choice questions.</td><td colspan="3">Open-book assessment candidates will produce a report based on practical based case study</td></tr>
<tr><td>Software Development: Developing Websites for Multiplatform Use
(H1J9 35)</td><td colspan="4">Open-book assessment candidates will produce a report (of approximately 1000 words) based on practical based case study.</td></tr>
<tr><td>Managing a Web Server
(H16S 35)</td><td colspan="4">Open-book assessment candidates requires to product a short report (of approximately 500 words) based on practical based case study.</td></tr>
<tr><td>HND Computer Science: Graded Unit 2 (Project)
(H48Y 35)</td><td colspan="4">Project: The candidate will be required to provide documentation which supports evidence of the candidate’s ability to plan, develop, implement and evaluate technical skills gained throughout there course.

Delivering centres may wish to consider enrolling external clients to support these projects as this has always proved to be beneficial for centre, external client and above all candidate.</td></tr>
</table>

This award does not impose a rigid delivery schedule, however colleges should be aware that if a holistic, natural approach to assessment is adopted the same case study can be adopted to cover the requirements of three of the four core Units, *Relational Database Management Systems* (H16W 35), *Software Development: Developing Websites for Multiplatform Use* (H19J 35) and *Managing a Web Server* (H16S 35). This could take the form of cross assessing the Units but it is more likely that centres will adopt the same scenario but will keep each Unit assessment instruments separate.

6 Guidance on approaches to delivery and assessment

The contents of the HND Computer Science have been updated to reflect contemporary technologies and methodologies. The award has attempted to blend traditional underpinning concepts of problem solving (both in terms of software developments, networking and technical support) whilst developing these with in a number of technological advancements including:

- growth of Web 2.0 technologies
- increase in social media
- increase in mobile technology
- increase in focus on software development.

The new award seeks to embrace these technological changes.

The award may be delivered full-time or part-time. It is hoped to develop online learning materials for some, or all, of the mandatory Units at a later date.

There is no defined sequence of delivery as the award is designed to allow centres as much freedom of choice with regards to the many optional Units. The centre will in essence be able to offer an award which although constricted by the core Units is flexible to offer an award which can genuinely meet local needs.

Assessment will cover a variety of knowledge and practical skills as well as the more intellectual skills of planning and evaluating. These together with the Core Skills mean that a large number of different methods are employed to ensure that a learner ‘can do what s/he is supposed to do’ and ‘knows what s/he is supposed to know’.

A large proportion of Units take a ‘project’ approach using the product of a previous assessment, as the foundation of the next and the purpose is to give the candidate a true reflection of how items being studied integrate and relate to industrial practice. Where this is practical, a holistic approach is encouraged to be taken by centres in assessing across a number of Outcomes within Units or across a number of Units.

The benefit of ‘cross-assessment’, if it goes well, is the achievement of several Outcomes on several Units with just one assessment instrument. A matching disadvantage is that a failure results in several Units not being achieved. It would be wise for centres to consider separating out the 'retake' assessments of students who have failed in their first attempt at a composite assessment instrument.

It may be possible to combine the delivery of Units in such a way as to create a thematic delivery of the component Units. The ways in which Units may be integrated is left to centres but thematic delivery, as opposed to discrete Unit delivery, may reduce assessment and improve coherence of content.

The normal rules of re-assessment apply to this award. Candidates are normally permitted one re-assessment, or, in exceptional circumstances, two re-assessments at the discretion of the centre.

All of the second year core Units are double credits. This was a conscientious decision which was works well as a method of reducing the quantity of assessments, without compromising quality, as well as allowing the learner greater time to carry out in-depth scholarly activities.

Centres should be encouraged to source external clients to support the HND Computer Science Graded Unit. As well as providing a platform for developing 'soft skills' the use of external clients improves the quality of submitted projects and prepares the learner for employment.

6.1 Sequencing/integration of Units

Providing the mandatory Units of the award are covered, centres are free to devise their own sequence for delivery of Units. It is recommended however that SCQF level 7 Units are undertaken in Year 1 with SCQF level 8 Units concentrated towards the end of Year 2. Where possible, learners should complete a SCQF level 7 Unit before undertaking an associated SCQF level 8 Unit. For example:

<table>
<tr><th>Semester 1
HND (Year 1)</th><th>Semester 2
HND (Year 1)</th><th>Core Unit in HND (Year 2) framework</th></tr>
<tr><td>Database Design Fundamentals (DV6E 34)</td><td>SQL: Introduction (DH3J 34)</td><td>Relational Database Management Systems (H16W 35)</td></tr>
<tr><td colspan="3">It is suggested that if the centre chooses Database Design Fundamentals and SQL: Introduction that these are integrated.</td></tr>
<tr><td colspan="2">Developing Mobile Web Based Application: An Introduction (H17J 34)</td><td>Software Development: Developing Websites for Multiplatform Use (H1J9 35)</td></tr>
<tr><td colspan="3">Centres should be aware that there are a number of Units within this component of the award which could be integrated. Human Computer Interaction (H17L 34) could be assessed along with both Web Development and Mobile Development Units.</td></tr>
<tr><td></td><td>Managing a Web Server(H17P 34)</td><td>Managing A Web Server (H16 S35)</td></tr>
<tr><td colspan="3">A number of the vendor options could be used to support this Unit.</td></tr>
<tr><td colspan="2">SD: Applications Development (D76N 34)</td><td>HND Computer Science: Graded Unit 2 (Project)</td></tr>
<tr><td colspan="3">The Graded Unit will be assessed separately. Previous assessment used to provide evidence should not be used as evidence for this particular Unit.
The learners should be encouraged to source external clients from the surrounding area. As the Graded Unit is a means of contextualizing the other core Units it could be taught throughout the year. This longitudinal approach will allow the student more time to carry out scholarly activities to support the submission.</td></tr>
</table>

In selecting combinations of optional Units centres are also likely to consider issues such as:

- Articulation arrangements with universities
- Needs of employers
- Resources available to the centre

An example course schedule plan is suggested below, based upon a 2 Year course with each year comprising of two semesters. Note that centres are free to devise their own alternative course plans:

Key c = core Unit, o = optional Unit

YEAR 1: HND Computer Science							
	Semester 1	**level**	**credits**		**Semester 2**	**level**	**credits**
c	Developing Software: Introduction (H173 34)	7	1	**c**	HNC Computing: Graded Unit 1: Exam H1J8 34	7	1
c	Computer Systems Fundamentals (H175 34)	7	1	**c**	Team Working in Computing (H178 34)	7	1
c	Professionalism and Ethics in Computing (H1F7 34)	7	1	**c**	Troubleshooting Computer Problems (H177 34)	7	1
o	Database Design Fundamentals (DV6E 34)	7	1	**o**	SQL: Introduction (DH3J 34)	7	1
o	Computing: Introduction to Project Management (H17D 34)	7	1	**o**	Managing a Web Server (H17P 34)	7	1
o	Human Computer Interaction (H17L 34)	7	1				
o	E-Commerce: Publishing Web Sites (DV6G 34)					7	2
o	Developing Mobile Web Based Applications: An Introduction (H17J 34)					7	2

YEAR 2: HND Computer Science							
	Semester 1	**level**	**credits**		**Semester 2**	**level**	**credits**
c	Software Development: Developing Websites for Multiplatform Use (H1J9 35)	8	2	**c**	HND Computer Science: Graded Unit 2 (Project)	8	2
c	Relational Database Management Systems (H16W 35)	8	2	**o**	Ethical Hacking (J0HK 34)	7	1
c	Managing a Web Server (H16S 35)	8	2	**o**	Mathematics for Computing 1 (D76E 34)	7	1
o	Cloud Computing (H179 34)	7	1	**o**	Systems Development: Introduction (H180 34)	7	1
				o	Computer Forensics Fundamentals (H1EN 34)	7	1
o	Software Development: Object Oriented Programming (H171 35)					8	2

1 All instruments of assessment used within this Group Award should be internally moderated, using the appropriate policy within the centre and the guidelines set by SQA.
2 External moderation will be carried out by SQA to ensure that internal assessment is within the national guidelines for these qualifications.

Further information on internal and external moderation can be found in *SQA's Guide to Assessment and Quality Assurance for Colleges of Further Education* **(www.sqa.org.uk)**

6.2 Recognition of Prior Learning

SQA recognises that learners gain knowledge and skills acquired through formal, non-formal and informal learning contexts.

In some instances, a full Group Award may be achieved through the recognition of prior learning. However, it is unlikely that a learner would have the appropriate prior learning and experience to meet all the requirements of a full Group Award.

The recognition of prior learning may **not** be used as a method of assessing in the following types of Units and assessments:

- HN Graded Units
- Course and/or external assessments
- Other integrative assessment Units (which may or not be graded)
- Certain types of assessment instruments where the standard may be compromised by not using the same assessment method outlined in the Unit
- Where there is an existing requirement for a licence to practice
- Where there are specific health and safety requirements
- Where there are regulatory, professional or other statutory requirements
- Where otherwise specified in an assessment strategy

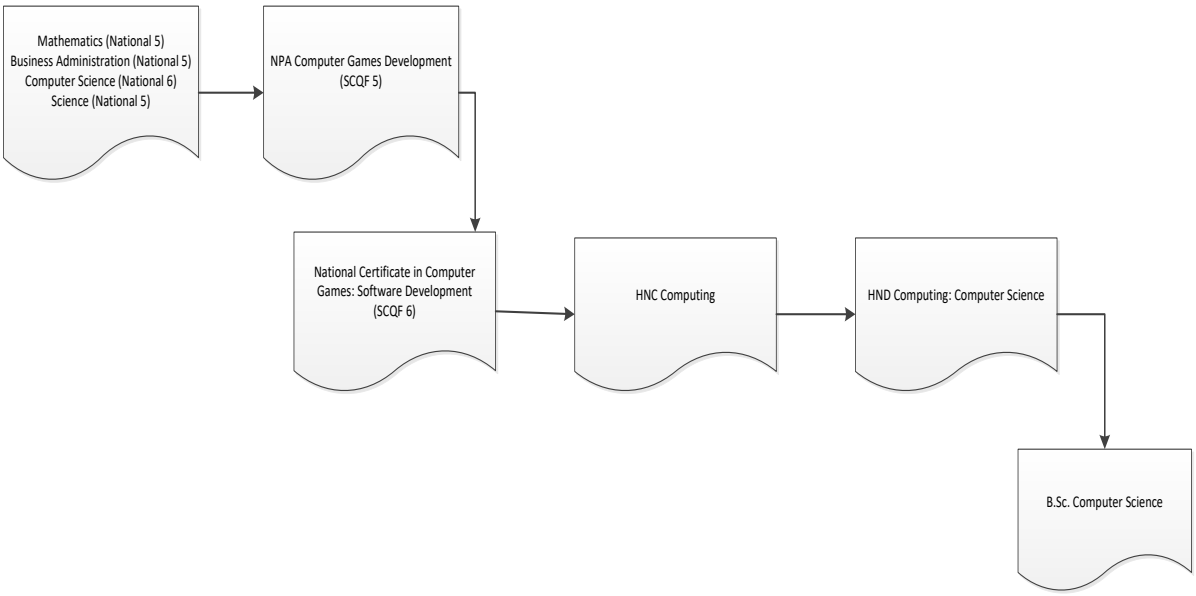
More information and guidance on the *Recognition of Prior Learning* (RPL) may be found on our website **www.sqa.org.uk**

The following sub-sections outline how existing SQA Unit(s) may contribute to this Group Award. Additionally, they also outline how this Group Award may be recognised for professional and articulation purposes.

6.2.1 Articulation and/or progression

This award has been designed to allow centres to forge a range of articulation routes to a wide range of degree courses at universities throughout Scotland. Some articulation routes are likely to require centres to select specific Units from the optional lists. For example, articulation to the 2nd year of the more traditional Universities such as the University of Strathclyde and the University of Glasgow might well require candidates to have achieved a certain level of Mathematics. In a similar vein direct entry to some third year courses might require some exposure to database development which could be achieved by adopting the Relational Database Management Systems Unit.

The following diagram illustrates one particular progression path for this award.



These articulation agreements represent only those centres that were directly contacted by the lead developer of this qualification and were chosen to represent the possible geographic areas within Scotland who may adopt this award.

In all cases the universities indicated that *Software Development: Object Oriented Programming* (H171 35) should be one of the options chosen.

Articulation Agreements

Robert Gordon University	BSc (Honours) Computing (Application Software Development) BSc Business Information Systems	Direct entry into Year 3 (based on optional Unit chosen) Direct entry into Year 2 (based on optional Unit chosen)
Stirling University	BSc Computer Science (Honours) BSc Software Engineering	Direct entry into Year 2/3 (based on optional Unit chosen) Direct entry into Year 2 (based on optional Unit chosen)
Abertay University	BSc (Honours) Computing BSc (Honours) Web Design & Development BSc (Hons) Engineering & Intelligent Systems BSc (Hons) Digital Forensics BSc (Hons) Ethical Hacking	Direct entry into Year 3 (based on optional Unit chosen) Direct entry into Year 3 (based on optional Unit chosen) Direct entry into Year 3 (based on optional Units chosen). These courses will be available from 2015/16
University of the Highlands and Islands (UHI)	BSc Computing (Honours)	Direct entry into Year 3 (based on optional Unit chosen)
Napier University	BSc IT Management	Direct entry into stage 3 (level 9) with a sufficient pass mark in Graded Unit.

6.2.2 HN Enhancement Project

The most popular destination for graduates from this award is university.

SQA has recently received money from the *Scottish Funding Council* to improve articulation from college to university. It was agreed that a new project 'HN Enhancement' would commence where the primary aim would be to identify whether and what enhancements might be necessary to improve articulation between college HN programmes and university degree courses.

The project will explore four subject areas, one of which is Computing, to see how the existing awards can be improved to make the transition from college to university easier for students.

As part of the project, a Qualification Review Team (QRT) for the area of Computing has been formed consisting of college and university representation (including the Open University). Their role is to look at the structure, contents, assessment and supporting guidance to see if some or all of these can be improved to support articulation.

The project has six defined objectives. These are:

1 Undertake initial scoping work to:

- identify good practice and barriers to articulation in SQA HN qualifications
- identify and consider the broader implications of enhancements across the sectors
- identify and consider policy and guidance activity required to support the above

2 Establish Qualification Review Teams to explore the above in the context of each subject pilot area.

3 Develop supporting guidance for any new approaches to HN development and/or assessment where required.

4 Consider alignment in relation to degree-level assessment structures.

5 Undertake restricted pilot activity over an agreed period of time.

6 Evaluate the impact of the changes and decide on roll-out to more or all SQA HN Qualifications.

This project is on-going. A QRT for Computing has been formed and the first meeting has taken place. At the time of writing, it is likely that additional assessments and guidance will be produced for this award to aid articulation between college and university.

Whatever enhancements are approved and developed, these will be piloted from August 2013.

6.2.3 Professional recognition

There are two professional bodies associated with this development:

1 E-Skills UK
2 British Computer Society

E-Skills UK is the Sector Skills Council with special responsibility for the IT sector. The Director of Qualifications (Chris Morrow) is a member of the Sector Panel for Computing and IT.[2] This development has been discussed at Sector Panel on several occasions. Separately from this, E-Skills has been kept abreast of developments on an on-going basis. The current draft proposals are with E-Skills for their comment.[3]

The validation panel includes an ex-member of E-Skills UK, who maintains links with that organisation.

The *British Computer Society* (also known as *The Chartered Institute for IT*) is the main professional body for the subject area. BCS also has representation on the Sector Panel. No formal accreditation between this award and BCS is proposed. However, an indication of that organisation's broad support for the award is currently being sought.

The Sector Panel for Computing and IT includes a wide range of professional representation (in additional to E-Skills and BCS), including:

- Scotland IS
- Skills Development Scotland
- Cisco
- Microsoft
- Oracle

This award has been considered by the Panel on several occasions during its inception and development, and the Panel has expressed its support for it on each occasion.

6.2.4 Transitional Arrangements

HN awards in Computing have a long tradition of providing detailed guidance on credit transfer between existing and new awards.[4] This is done, at the request of centres and External Verifiers, to ensure consistency between centres. Credit transfer tables have been provided in this subject area since 1995. However, final decisions relating to credit transfer lies with centres.

Section 6.2.5 has been populated with equivalent Units which have been approved by an External Verifier. The External Verifier uses specific criteria to determine when two Units are equivalent and one can provide credit for another. Many of the 'new' (2011/12) Units in this table are revisions of the 'old' (2004/5) Units, making credit transfer more credible and easier to identify.

[2] The Sector Panel is a long-standing SQA committee, which aims to capture external stakeholder input for planning and development purposes.

[3] E-Skills does not guarantee to provide feedback on qualification proposals to awarding bodies. This may or may not be provided based on available capacity.

[4] Standard SQA policy is to permit centres to decide on credit transfer.

Units within computing related frameworks prior to 2004 are not eligible for credit transfer into the new framework due to the importance of contemporary skills in this sector.

6.2.5 Credit transfer

HNC Computing was validated by SQA in December 2011 and HND Computer Science awards are due for validation in December 2012. These courses will replace a number of older Group Awards including:

G7GL 15	HNC Computing
G7DX 15	HNC Computer Networking
G7DY 16	HND Computer Networking and Internet Technology
G7TT 16	HND Computing: Software Development
G7TR 16	HND Computing: Technical Support

These Group Awards have been available since 2004/5 and themselves replaced older Group Awards, dating back to 2001. This section covers **full** credit transfer from Units in the 2004/5 Group Awards to Units in the 2012 Group Awards.

When new Group Awards are introduced, students often wish to transfer between the old and the new frameworks. For example, they may have started on an HNC under an older framework and wish to complete their HND on the new framework, or they may have completed Units some time ago and wish to use these as part of an HNC or HND under the new framework.

To assist in this process, SQA normally provides centres with guidance on Credit Transfer between the old and the new frameworks. SQA have clear criteria for deciding if two syllabuses are equivalent. All the following criteria must be satisfied if full credit transfer is to be recognised between both syllabuses:

1 The syllabuses have the same SCQF levels.
2 The syllabuses have the similar credit values (or equivalent).
3 The syllabuses are equivalent in terms of Core Skill coverage.
4 The syllabuses relate to the same subject area and the main topics are common to both.
5 The syllabuses present a similar level of cognitive demand.
6 The syllabuses encompass similar skill-sets.
7 The syllabuses are contemporary in terms of terminology, techniques and technology.
8 Employers, admission officers and other users would perceive both syllabuses as broadly equivalent.
9 The assessment demands are similar in terms of candidate activity and Performance Criteria, or candidates would be equally likely to pass both assessments.
10 Special conditions (where they exist) are applicable to both syllabuses.

This guidance is of an advisory nature. **The final decision on whether or not to grant credit transfer must be made by the centre and is subject to external moderation**. However, external moderators are unlikely to raise objections to any credit transfer based on the advice given here.

	2004/5 GROUP AWARD UNITS		2012 GROUP AWARD UNITS
Unit No	**Unit title**	**Unit No**	**Unit title**
DF9M 34	Client Operating System	H1EM 34	Client Operating Systems
DH2Y 34	Computer Hardware: Hardware Installation and Maintenance	H1FY 34	Computer Hardware: Hardware Installation and Maintenance
F1XA 34	Computing: PC Hardware and Operating System Essentials	H17E 34	Computing: PC Hardware and Operating Systems Essentials
F1X9 34	Computing: PC Hardware and Operating System Support	H17F 34	Computing: PC Hardware and Operating Systems Support
DH36 34	Computing: Graded Unit 1 (Exam)	H1J8 34	Computing: Graded Unit 1 (Exam)
DH37 34	Information Technology: Information Systems and Services	H1G0 34	IT: Information Systems & Services
DM30 35	Project Management 1	H17D 34	Computing: Introduction to Project Management
DH31 34	Computer Networks: Building Local Area Networks	H17C 34	Computer Networks: Building Local Area Networks
D75V 35	Computer Networks: Network Technology and Data Communications	H16V 35	Network Technology and Data Communications
DH32 35	Software Development: Developing for the World Wide Web	H1J9 35	Software Development: Developing Websites for Multiplatform Use
DH2X 34	Providing Support to Users	H17T 34	Providing Support to Users
DH3D 35/FE77 35	Software Development Relational Database Systems	H16W 35	Relational Database Management Systems
D76V 35	Software Development Object Oriented Programming	H171 35	Software Development: Object Oriented Programming
DH3F 34	Systems Development: Introduction	H180 34	Systems Development: Introduction
DN4N 35	Computing: Software Development: Graded Unit 2 (Project)	H48W 35	Computing: Software Development: Graded Unit 2 (Project)
DN4P 35	Computing: Technical Support: Graded Unit 2 (Project)	H48X 35	Computing: Technical Support: Graded Unit 2 (Project)
DG0H 35	Computer Networking and Internet Technology: Graded Unit 2 (Project)	H48V 35	HND Computing: Networking Graded Unit 2 (Project)
F0N0 35	Professional Issues in Computing	H1F7 34	Professionalism and Ethics in Computing
DH21 34 **and** D75X 34	Working Within a Project Team **and** Information Technology: Applications Software 1	H178 34	Team Working in Computing
DH2T 34 **and** DH33 34	Computer Architecture 1 **and** Computer Operating Systems 1	H175 34	Computer Systems Fundamentals

	2004/5 GROUP AWARD UNITS		2012 GROUP AWARD UNITS
Unit No	**Unit title**	**Unit No**	**Unit title**
F6BV 35	Human Computer Interface	H17L 34	Human Computer Interaction
D59P 34	Network Concepts	H17S 34	Network Concepts
DG02 34	Security Concepts	HT9G 34*	Network Security Concepts
DM3H 35	Systems Development: Object Oriented Design	H172 35	Systems Development: Object Oriented Analysis and Design
DG07 34	Mail Server Administration	H17N 34	Mail Server Management
D75V 35	Computer Networks: Network Technology and Data Communications	H17A 34	Computer Networking Fundamentals

6.3 Opportunities for e-assessment

Where appropriate the centre should try to adopt ICT. The use of social media such as blogs should be encouraged. Innovative methods such as the use of video or audio evidence should be used where appropriate.

As part of an assessment strategy, it makes sense to investigate the option of e-assessment to support the programme. E-assessment may take a number of forms, and while it may be feasible in the future to conduct all assessment in an on-line format, currently some formats are more amenable to e-assessment than others.

The most obvious format is that of objective tests (most frequently Multiple-Choice tests), and some SQA Units already have an Evidence Requirement mandating the use of this type of test. Centres should adopt tests supported by SOLAR (**www.sqasolar.org.uk**) where appropriate.

Below is a sample of where the possibility of e-assessment exist within the cores and speculates on which may be suitable in the near future.

Multiple-Choice/Response e-assessment opportunities		
Unit title	**Code**	**Outcome**
Relational Database Management Systems	H16W 35	1

e-portfolio opportunities			
Unit title	**Code**	**Outcome**	**Type**
HND Computer Science: Graded Unit 2 (Project)	H48Y 35	All	Project proposal Project Documentation
Relational Database Management Systems	H16W 35	2, 3 and 4	Case study documentation
Software Development: Developing Websites for Multiplatform Use	H1J9 35	All	Technological report Storyboard/Prototype
Managing a Web Server	H16S 35	1	Technical Report e-log

6.4 Support materials

A list of existing ASPs is available to view on SQA's website.

A range of Assessment Support Packs (ASPs) have been produced for a number of mandatory and optional Units in this Group Award. These packs are available on the SQA secure website and access can be sought through the SQA co-ordinator in each centre.

6.5 Resource requirements

Individual centres may wish to develop their own strategies to support this programme. However given the development of cloud computing, centres may wish to form consortiums which will spread both CPD and technical needs.

Completion of this qualification would not be possible without considering the core resources which are essential.

Web Server — students must be given access to a server local or remote and be able to experiment and test how these servers operate and support a platform supporting differing web tools and languages. It is recommended that centres could use a Web Server of a current standard to accommodate server-side scripting.

This award has been developed with vendor neutrality and is expressed in generic terms. However centres may consider delivery within a Microsoft context using Internet Information Server (IIS) or Apache under a UNIX/Linux context, with candidates implementing a Linux, Apache, MySQL and PHP (LAMP) environment, this type of environment currently being the most popular and secure web server application platform.

Database access can be done by giving the candidate a predefined database or by the candidate composing a database relevant to their chosen project.

The actual database package used could be at least ODBC (Open Database Connectivity), JDBC (Java Database Connectivity) or CFML (ColdFusion Mark-up Language) compliant.

SQL/ORACLE database schemata supporting a front end interface such as MySQL Browser, SQL Workbench or such like would be appropriate. Centres cannot offer this award by simply utilising Microsoft ACCESS. Most if not all of these tools can be found 'free of charge' but technical support is limited.

Unit involved in the teaching of programming languages should consider Java or C# or equivalent if the majority of the centres learners intend carrying on in tertiary education.

In addition, universities have indicated that learners should have ideally completed D76E 34 *Mathematics for Computing 1* and/or D76F 35 *Mathematics for Computing 2.*

7 General information for centres

Equality and inclusion

The Unit specifications making up this Group Award have been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners will be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. Further advice can be found on our website **www.sqa.org.uk/assessmentarrangements**

Internal and external verification

All assessments used within this/these qualification(s) should be internally verified, using the appropriate policy within the centre and the guidelines set by SQA.

External verification will be carried out by SQA to ensure that internal assessment is within the national guidelines for these qualifications.

Further information on internal and external verification can be found in *SQA's Guide to Assessment* **(www.sqa.org.uk/GuideToAssessment)**.

8 Glossary of terms

Embedded Core Skills: is where the assessment evidence for the Unit also includes full evidence for complete Core Skill or Core Skill components. A learner successfully completing the Unit will be automatically certificated for the Core Skill. (This depends on the Unit having been successfully audited and validated for Core Skills certification.)

Finish date: The end of a Group Award's lapsing period is known as the finish date. After the finish date, the Group Award will no longer be live and the following applies:

- candidates may not be entered for the Group Award
- the Group Award will continue to exist only as an archive record on the Awards Processing System (APS)

Graded Unit: Graded Units assess learners' ability to integrate what they have learned while working towards the Units of the Group Award. Their purpose is to add value to the Group Award, making it more than the sum of its parts, and to encourage learners to retain and adapt their skills and knowledge. (**Note to writer:** delete if not applicable to product type)

Lapsing date: When a Group Award is entered into its lapsing period, the following will apply:

- the Group Award will be deleted from the relevant catalogue
- the Group Award specification will remain until the qualification reaches its finish date at which point it will be removed from SQA's website and archived
- no new centres may be approved to offer the Group Award
- centres should only enter candidates whom they expect to complete the Group Award during the defined lapsing period

SQA credit value: The credit value allocated to a Unit gives an indication of the contribution the Unit makes to an SQA Group Award. An SQA credit value of 1 given to an SQA Unit represents approximately 40 hours of programmed learning, teaching and assessment.

SCQF: The Scottish Credit and Qualification Framework (SCQF) provides the national common framework for describing all relevant programmes of learning and qualifications in Scotland. SCQF terminology is used throughout this guide to refer to credits and levels. For further information on the SCQF visit the SCQF website at **www.scqf.org.uk**

SCQF credit points: SCQF credit points provide a means of describing and comparing the amount of learning that is required to complete a qualification at a given level of the Framework. One National Unit credit is equivalent to 6 SCQF credit points. One National Unit credit at Advanced Higher and one Higher National Unit credit (irrespective of level) is equivalent to 8 SCQF credit points.

SCQF levels: The level a qualification is assigned within the framework is an indication of how hard it is to achieve. The SCQF covers 12 levels of learning. HNCs and HNDs are available at SCQF levels 7 and 8 respectively. Higher National Units will normally be at levels 6–9 and Graded Units will be at level 7 and 8. National Qualification Group Awards are available at SCQF levels 2–6 and will normally be made up of National Units which are available from SCQF levels 2–7.

Subject Unit: Subject Units contain vocational/subject content and are designed to test a specific set of knowledge and skills.

Signposted Core Skills: refers to opportunities to develop Core Skills arise in learning and teaching but are not automatically certificated.

History of changes

It is anticipated that changes will take place during the life of the qualification and this section will record these changes. This document is the latest version and incorporates the changes summarised below. Centres are advised to check SQA's APS Navigator to confirm they are using the up to date qualification structure.

NOTE: Where a Unit is revised by another Unit:

- No new centres may be approved to offer the Unit which has been revised.
- Centres should only enter candidates for the Unit which has been revised where they are expected to complete the Unit before its finish date.

Version Number	Description	Date
22	**Addition of Optional Unit:** HF58 34 **-** Web Development: Essential Content added to Group 4 Options.	14/09/21
21	**Addition of Optional Unit:** FW5D 34 - Website Design, Multimedia Content Creation added to Group 1 as an optional unit.	24/08/21
20	**Revision of Unit:** H1EP 34 Ethical Hacking: Fundamentals (finish date 31/07/2021) has been replaced by J0HK 34 Ethical Hacking (start date 01/08/2018)	31/07/21
19	**Addition of Optional Unit:** J4BF 34 Cryptography: Practical Applications, J4YB 35 Programming for Data and J4YD 36 Machine Learning added in Group 1	10/12/20
18	**Addition of Optional Unit:** J27L 34 Data Flow added as an Optional unit	23/03/20
17	**Addition of Optional Unit:** J0H9 34 Data Security added as an Optional unit.	17/12/19
16	**Revision of Units:** H17V 34 Security Concepts (finish date 31/07/2020) has been replaced by HT9G 34 Network Security Concepts.	24/09/19
15	**Revision of Unit:** J0SA 34 Firewall Essentials has been replaced by J2JW 34 Firewall Essentials due to the credit value being increased from 1 to 2 J0SA 34 Finishes on 31/07/2021	13/08/19
14	**Revision of Unit:** H1EN 34 Computer Forensics: Fundamentals (finish date 31.07.2021) has been revised and replaced by J0HL 34 Digital Forensics	30/11/18
13	**Addition of Local Optional Unit: FM97 35** Self Describing Data (XML) added to framework as Local Optional unit	22/11/18
12	**Addition of Optional Units:** HT9T 34 Artificial Intelligence, J0J8 34 Computer Architecture,J11V 34 Computer Operating Systems,J11W 35 Computer Operating Systems, J0HA 34 Computer Programming, HF85 34 Emerging Technologies & Experiences, J0SA 34 Firewall Essentials, J0HC 34 Internet of Things, J0J9 34 Machine Learning, J1BB 35 Machine Learning, J11T 34 Robotics: Fundamentals have been added to the Group 1 of the Optional Section.	29/08/18
11	**Addition of Optional Unit:** HT6W 35 Open Source Operating Systems: Introduction to Command Line	18/07/18

	Administration added to Group 1 Specialist options	
10	**Revision of Unit:** F871 35 Artificial Intelligence and Critical Thinking has been replaced by HH3D 35 Artificial Intelligence for Computer Games.	18/11/2016
09	**Revision of Units:** F6C2 35 Web Development: Dynamically Generated Content has been replaced by HF57 35. F1VV34 User Interface Design has been replaced by HF55 34. H17J 34 Developing Mobile Web Based Applications: An Introduction has been replaced by HF4Y 34.	12/07/16
08	**Addition of Optional Units:** H9DE 34 Digital Skills (Group 2)	27/08/2015
07	**Revision of Unit:** DE1K 33 Workplace Communication in English has been revised -by H8T2 33 and finishes on 31/07/2016.	19/05/15
06	Addition of Optional Units: D85F 34 Using Software Applications Packages (Group 2), D75X 34 Information Technology: Applications Software 1 (Group 2), DH35 34 Computing: Planning (Group 2), H8W8 34 Big Data (Group 1), H8W9 35 Data Science (Group 1), H8N5 35 Private Cloud Virtualisation (Group 1)	10/04/15
05	**Revision of Unit**: DK2K 34 Getting Started in Business *has been revised by* H7V4 34 Preparing to Start a Business *and will finish on* 31/07/2016.	20/01/2015
04	*Bring Your Device (BYOD): Introduction* (H6D0 34) added as an optional Unit to framework (Group 2). Napier University articulation route added.	09/06/14
03	**Addition of optional Units: Group 3:** *Database Design and Programming in SQL* (H4KJ 34) and *Database Programming with PL/SQL* (H4KP 35).	22/10/13
02	**Addition of optional Unit**: *Cloud Computing* (H179 34).	09/08/13

Acknowledgement

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of this qualification.

9 General information for learners

This section will help you decide whether this is the qualification for you by explaining what the qualification is about, what you should know or be able to do before you start, what you will need to do during the qualification and opportunities for further learning and employment.

This HND Computer Science is suitable for a range of learners including:

- School leavers who wish to embark on a course which will lead to either higher education or IT industry employment.
- Employed or unemployed adults wishing to retrain for a career in technical support.

By undertaking the award you are also expected to continue to benefit from the many existing arrangements that exist between FE colleges and Universities, for articulation into the 2nd or 3rd year of University degree programs.

At the discretion of a centre, you may be permitted to enter the award by waiving some of the entry requirements — based on your previous experience.

To achieve the award you will need to pass a minimum of 30 credits from the HND Computer Science award including all 14 of the mandatory Units.

Units are assessed by a combination of exams, projects and logs/portfolios. Included within the mandatory Units are a *Computing: Graded Unit 1* (Examination) in Year 1 and a *Computing: Graded Unit 2* (Project) in Year 2.

In the first year of the award you will learn a range of introductory computing topics relating to computer systems and how to troubleshoot faults on them. You will also learn about team working and some of the legislation that governs securing the electronic data that is stored on systems.

In the second year of the award you will demonstrate a range of routine skills, techniques, practices and/or materials associated with website development involving advanced or complex programming techniques.

Units are assessed by a combination of exams, projects and logs/portfolios. Included within the mandatory Units are a *Graded Unit (Exam)* in Year 1, and a *Graded Unit (Project)* in Year 2.