Awarding Great British Qualifications

Level 4 Diploma in Computing (L4DC)
Qualification Unit Specification
2017/18

Modification History

Version	Revision Description
V1.0	For release
V1.1	Version for academic year 2014/15
V1.2	Version for academic year 2015/16
V1.3	Version for academic year 2015/16 (Updated for Revised IT Assessment Strategy)
V1.4	Minor addition to wording for *Section 3*
V1.5	Addition of Total Qualification Time information
V1.6	Updated qualifications framework information
V1.7	Added the TQT and GLH figures
V1.8	Update to the assessment method of Designing and Developing a Website unit

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1. About NCC Education

NCC Education is a UK awarding body, active in the UK and internationally. Originally part of the UK National Computing Centre, NCC Education started offering IT qualifications in 1976 and from 1997 developed its Higher Education portfolio to include Business qualifications, IT qualifications for school children and a range of Foundation qualifications.

With Centres in over forty countries, four international offices and academic managers worldwide, NCC Education strives to employ the latest technologies for learning, assessment and support. NCC Education is regulated and quality assured by Ofqual (the *Office of Qualifications and Examinations Regulation*, *see* www.ofqual.gov.uk) in England and Northern Ireland.

1.1 Why choose this qualification?

NCC Education's Level 4 Diploma in Computing is:

- **Regulated** by Ofqual and listed on the Qualifications and Credit Framework – Qualification Number 600/0406/X. The Regulated Qualifications Framework (RQF) is a credit-based qualifications framework, allowing candidates to take a unit-based approach to building qualifications.

  For more information see:

  http://ofqual.gov.uk/qualifications-and-assessments/qualification-frameworks/

- **Quality assured** and well established in the UK and worldwide

- **Recognised and valued** by employers and universities worldwide

- **A pathway qualification** for candidates who wish to complete the NCC Education degree journey. This qualification is equivalent to the first year of an IT degree qualification in the UK university system and will allow access to the NCC Education Level 5 Diploma in Computing. As well as this, completion will allow entry on to the NCC Education Level 5 Diploma in Business Information Technology, which is equivalent to the second year of Business Information Technology degree. Successful candidates will also be able to transfer to a university or pursue a career in the IT industry.

Candidates will be given the opportunity to develop essential thinking and study skills, not only within the computing domain, but also within the context of business through a balance of academic and vocational subjects.

2. Structure of the L4DC Qualification

Qualification Title, Credits, Units and Level
NCC Education Level 4 Diploma in Computing (RQF), 120 credits, all at RQF Level 4. **Total Qualification Time: 1,200 hours.** **Guided Learning Hours: 540 hours.** **Candidates must pass all 8 Units to be awarded the L4 Diploma in Computing certificate.**

Skills for Computing (15 credits)	Computer Networks (15 credits)	Computer Systems (15 credits)	Designing and Developing Object-Oriented Computer Programs (15 credits)
Designing and Developing a Website (15 credits)	Databases (15 credits)	Software Development Techniques (15 credits)	Office Solutions Development (15 credits)

Please see Section 5 below for Syllabuses, which include the Guided Learning Hours and Total Qualification Time for each Unit of the Level 4 Diploma in Computing.

This qualification is regulated by Ofqual and listed on the Qualifications and Credit Framework – Qualification Number 600/0406/X. For further information see http://register.ofqual.gov.uk/Qualification/Details/600_0406_X

3. Assessment for the qualification

3.1 Assessment objectives

All assessment for the qualification is intended to allow candidates to demonstrate they have met the relevant Learning Outcomes. Moreover NCC Education's assessment is appropriate to the assessment criteria as stated in this specification and is regularly reviewed to ensure it remains consistent with the specification.

3.2 Overview of Qualification Unit Assessment

Unit	Assessment Methods		
	Global Examination	**Local Examination**	**Global Assignment**
Skills for Computing	50%	-	50%
Computer Networks	-	-	100%
Computer Systems	-	50%	50%
Designing and Developing a Website	-	-	100%
Databases	50%	-	50%
Designing and Developing Object-Oriented Computer programs	-	-	100%
Software Development Techniques	100%	-	-
Office Solutions Development	-	50%	50%

An examination is a time-constrained assessment that will take place on a specified date and usually in an NCC Centre. An assignment requires candidates to produce a written response to a set of one or more tasks, meeting a deadline imposed by the Centre. The overall Unit mark is computed from the weighted mean of its components. The pass mark for a Unit is 40%.

NCC Education Centres can provide candidates with a specimen assessment paper as well as a limited number of past examination and assignment papers.

Past examination and assignment papers may be made available only following results release for the corresponding assessment cycle. Results release dates and past examination and assignment release dates can be found in the Activity Schedules area of *Connect*, NCC Education's student registration system.

3.3 Accessibility of Assessment

We review our guidelines on assessment practices to ensure compliance with equality law and to confirm assessment for our Units is fit for purpose.

3.3.1 Reasonable adjustments and special consideration

NCC Education is committed to providing reasonable adjustments and special consideration so as to ensure disabled candidates, or those facing exceptional circumstances, are not disadvantaged in demonstrating their knowledge, skills and understanding.

Further information on NCC Education's arrangements for giving reasonable adjustments and special consideration can be found in the NCC Education *Reasonable Adjustments and Special Considerations Policy*.

3.3.2 Supervision and Authentication of Assessment

NCC Education Centres are required to organise all assessment activity for this specification according to NCC Education's Policies and Advice.

Candidates' identity and the authenticity of their work is verified and NCC Education moderates all assessment to ensure that the marking carried out is fair, and that the grading reflects the standard achieved by candidates as relevant to the specification Learning Outcomes and Assessment Criteria. Detailed guidance on this process and how candidate work must be submitted to NCC Education is given in NCC Education's *Examination Guidelines* and *Moderation Manual*. The Moderation Manual also includes full reminder checklists for Centre administrators.

4 Administration

4.1 Assessment Cycles

Four assessment cycles are offered throughout the year, in March, June, September and December.

Examination dates and assignment submission deadlines are published in the NCC Education *Activity Schedule*, which is provided to Centres by Customer Services. It is also available on *Connect,* NCC Education's student registration system.

The *Activity Schedule* also gives the key dates for registering candidates for assessment cycles, the dates when Centres can expect the assessment documentation and, ultimately, the assessment results from NCC Education.

4.2 Language of Assessment

All assessment is conducted in English.

4.3 Candidates

NCC Education's qualifications are available to those Centre candidates who satisfy the entry requirements as stated in this specification.

4.4 Qualification and Unit Entry Requirements

Entry Requirements
• Holders of either the NCC Education International Certificate in Computer Studies (ICCS) or Level 3 International Foundation Diploma for Higher Education Studies (L3IFDHES) qualifications. • Holders of the NCC Education Level 3 Diploma in Computing (L3DC) (RQF) • Holders of any local or international qualification deemed to be a similar level to either ICCS or L3IFDHES. These shall be agreed in advance with NCC Education. • Holders of one 'A' level or equivalent or an appropriate School Leaver's certificate. • Mature students, able to demonstrate over two years' relevant work experience. Students should also have 'O' Level/GCSE English and Maths or equivalent. For candidates whose first language is not English: • IELTS 5.5 or equivalent.

4.5 Candidate Entry

Candidates are registered for assessment via NCC Education's *Connect* system and according to the deadlines for registration provided in the *Activity Schedule*.

Candidates are registered for the assessment of each Unit they wish to take in a particular assessment cycle (e.g. Units A and B in June, Units C and D in September, Units E and F in December and Units G and H in March). This includes candidates who need to resit a particular Unit.

Further details can be found in NCC Education's *Operations Manual*.

4.6 Resits

If a candidate fails an assessment, they will be provided with opportunities to resit during the eligibility period.

Candidates may only seek reassessment in a previously failed Unit.

5. Syllabus

5.1. Skills for Computing

Title:	Skills for Computing

RQF code:	F/502/8335	**Credits**	15	**Level**	4

Guided Learning Hours	60	**Total Qualification Time**	150

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Be able to use various skills to support the study of Computing	1.1 Explain strategies and skills to support learning at RQF Level 4 and above 1.2 Appreciate the importance of contributing and listening to discussion-based learning activities 1.3 Write clearly in a style appropriate to learning at RQF Level 4 1.4 Explain the importance of using citations and bibliographies and avoiding plagiarism 1.5 Apply a commonly-used system of organising citations and bibliographies in one's own work
2. Be able to communicate in a technical environment	2.1 Explain and apply common industry standards for technical documentation 2.2 Employ various media to communicate clearly in English 2.3 Explain technical issues in a manner appropriate to a non-technical audience
3. Be able to deploy thinking skills and problem-solving paradigms in both a business and learning context.	3.1 Summarise a range of problem-solving and creative thinking techniques 3.2 Apply at least one problem-solving technique to a business and/or education-based problem 3.3 Apply a creative thinking technique to a problem based on one's own learning experience
4. Be able to handle and present data	4.1 Extract pertinent data from a given source 4.2 Design an appropriate document or spreadsheet to record given data 4.3 Record data accurately in a usable manner 4.4 Execute an elementary statistical analysis 4.5 Present data professionally in an appropriate format to a specified audience
5. Understand the need for lifelong learning	5.1 Explain the concepts of Continuing Professional Development (CPD) and lifelong learning 5.2 Explain the particular application of CPD and lifelong learning to the IT Profession

Syllabus Content	
Topic	**Course coverage**
Learning to Learn	• Learning Strategy (CREAM: Creative, Reflective, Effective, Active, Motivated). • Personal Learning Plans • Learning Situations: Lectures, Seminars, Tutorials and Labs • Continuing Professional Development (CPD) and Lifelong learning: applying your learning skills in other contexts ***Learning Outcomes: 1 & 5***
Reading, Listening and Note-taking	• Extracting information from written sources • Taking notes from a speaker • Taking minutes in a meeting ***Learning Outcome: 1***
Writing	• Analysing the question • Planning and structuring • Introductions and conclusions • Referencing ***Learning Outcomes: 1 & 2***
Presentation Skills	• Presentation Skills: researching, preparing, presenting and delivering ***Learning Outcomes: 2 & 4***
Problem Solving	• Problem Solving tools and techniques • Problem definition and analysis • Success criteria and selecting a solution ***Learning Outcome: 3***
Creative Thinking	• Creative Thinking Techniques: Lateral Thinking etc. • Creative Thinking Models: Parallel Thinking (De Bono 'Six Hats'), TASC (Thinking Actively in a Social Context) ***Learning Outcomes: 1 & 3***
Assignment Preparation	• Technical documentation; knowing your audience • Proof-reading • Exercises in writing and problem-solving based on topics 3-6, practising for assignment tasks ***Learning Outcomes: 1, 2 & 3***
Data Acquisition	• Methods of obtaining data • Types of data • Storing data ***Learning Outcome: 4***

Charts and Estimates	• Random variations • The importance of normal distributions. • Estimating the mean and median ***Learning Outcome: 4***
Accuracy and Correlation; Presenting Results	• Handling uncertainty • Data comparisons • Organising information • Charts and plots • Showing dependence ***Learning Outcomes: 2 & 4***
Regression Analysis	• Pearson correlation • Sample linear regression • Spearman correlation ***Learning Outcome: 4***
Data Handling Revision and Exam Preparation	• Revision planning exercise • Exercises based on sample exam questions ***Learning Outcomes: 1, 3, 4 & 5***

Related National Occupational Standards (NOS)
Sector Subject Area: 6.1 ICT Professional Competence **Related NOS:** 4.7.A.3 – Document, under supervision, specified information relating to system/solution/service designs; 5.5.A.1 - Assist with gathering and documenting information to support systems installation, implementation and handover; 5.5.P.2 - Document and present systems installation, implementation and handover activities; 6.1.S.3 - Communicate with others on information management activities; 6.2.A.2 - Document IT/technology security management processes

Assessments
Global Examination (50%) Global Assignment (50%)
See also Section 3 above

5.2. Computer Networks

Title:	Computer Networks

RQF code:	M/502/8332	**Credits**	15	**Level**	4

Guided Learning Hours	60	**Total Qualification Time**	150

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Understand network and communication protocols	1.1 Explain the overarching principles of the OSI seven-layer model 1.2 Explain the function of each layer of the OSI model, and the protocols associated with it. 1.3 Explain the function and application of a range of communication and network protocols. 1.4 Evaluate the use of various protocols against real-world purposes 1.5 Explain the function and rationale of wireless networking standards 1.6 Explain a range of contemporary wireless standards and their relevant applications.
2. Understand the principles of common network topologies and architectures	2.1 Explain the concept of network topology and its design. 2.2 Discuss various common network topologies and their application(s). 2.3 Propose a simple network topology in response to detailed requirements
3. Understand the application of network security measures	3.1 Install and configure a firewall on an internet-connected system 3.2 Install and configure essential software security measures
4. Be able to select and configure the hardware components of a computer network to meet the requirements of a precise specification.	4.1 Categorise network cables and connectors and their implementations 4.2 Select the hardware component of a network 4.3 Assemble the necessary hardware components to create a network according to a design specification 4.4 Configure the hardware components for a wireless network 4.5 Test the connectivity of a network 4.6 Troubleshoot client-side connectivity issues using appropriate tools

5. Be able to design and install network and server operating systems to meet the requirements of a precise specification.	5.1 Identify the software requirements for a computer network 5.2 Install and run appropriate network software according to a design specification. 5.3 Install and run software components for a wireless network. 5.4 Test the correct operation of network and server software
6. Be able to install and configure internet telephony and communication systems	6.1 Install and configure a Voice over IP (VoIP) system 6.2 Install and configure a web-based video conferencing solution 6.3 Install and configure a Virtual Private Network (VPN)

Syllabus Content	
Topic	**Course coverage**
Introduction to the Module and Networks	• Introduction to module • What is a network? • Real world networks • The OSI seven-layer model ***Learning Outcome: 1***
Network Protocols and Standards	• Communications and network protocols • Protocols and the OSI model • Protocols in real world networks • The Internet ***Learning Outcome: 1***
Wireless Networking Standards	• Wireless devices • Wireless networking standards • Issues for wireless networks • Wireless networking protocols ***Learning Outcome: 1***
Network Topology and Architecture	• Network topology concepts • Common network topologies and their application • Topologies and protocols ***Learning Outcome: 2***
Network Media and Connectors	• Network media • Network connectors • Selecting media and connectors ***Learning Outcome: 4***

Network Hardware	• Network hardware • Hardware selection • Creating a network ***Learning Outcome: 4***
Wireless Network Hardware	• Wireless network hardware • Wireless hardware selection • Creating a wireless network ***Learning Outcome: 4***
Security Software	• Network security threats • Security countermeasures • Security software • Installing and configuring security software ***Learning Outcome: 3***
Firewalls	• Functions of a firewall • Types of firewall • Installing and configuring a firewall ***Learning Outcome: 3***
Network and Server Software	• Network software requirements • Wireless network software requirements • Configuring network software ***Learning Outcome: 5***
Voice over IP and Video Conferencing	• Voice over IP (VoIP) • Video conferencing • Installing and configuring voice networks • Installing and configuring video networks ***Learning Outcome: 6***
Virtual Private Networks	• Virtual private networks (VPN) • Advantages and disadvantages of VPN • Installing and configuring VPN ***Learning Outcome: 6***

Related National Occupational Standards (NOS)
Sector Subject Area: 6.1 ICT Professional Competence **Related NOS:** 4.1.A.1 – Contribute to IT architecture work; 4.8.A.1 – Prepare, under supervision, for IT/technology infrastructure design and planning activities; 4.8.A.2 – Assist with IT/technology infrastructure design and planning activities; 4.8.A.3 – Assist others with relevant information concerning IT/technology infrastructure design and planning assignments; 5.4.A.1 - Perform systems integration activities as directed; 5.4.P.2 - Perform systems integration activities; 5.5.A.1 - Assist with gathering and documenting information to support systems installation, implementation and handover; 5.5.P.1 - Perform systems installation, implementation and handover activities

Assessments
Global Assignment (100%)
See also Section 3 above

5.3. Computer Systems

Title:	Computer Systems

RQF code:	L/601/0446	**Credits**	15	**Level**	4

Guided Learning Hours	60	**Total Qualification Time**	150

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Understand the function of computer systems	1.1 Explain the role of computer systems in different environments 1.2 Explain the hardware, software and peripheral components of a computer system 1.3 Compare different types of computer systems
2. Be able to design computer systems	2.1 Produce a system design specification to meet a client's needs 2.2 Evaluate the suitability of a system design specification
3. Be able to build and configure computer systems	3.1 Build and configure a computer system to meet a design specification 3.2 Test and document a computer system
4. Be able to undertake routine maintenance on computer systems	4.1 Perform routine maintenance tasks on a computer system 4.2 Upgrade the hardware and software on a computer system

Syllabus Content	
Topic	**Course coverage**
Introduction to Computer Systems	• Overview of the module • Types of computer – Personal, mini, mainframe, mobile, – Network, supercomputer, multiprocessor • History of modern computers – Show & tell of old and modern computer equipment – Student research on generations of computer ***Learning Outcome: 1***

Environments, Functions of components and Health & Safety	• Computing Environments
	  – Home, business, computer gaming, networking, real-time, communication
	• Von Neumann architecture
	  – Example processors
	  – Fetch execute cycle
	• Internet research – Different types of processor.
	  – RISC v CISC
	  – Single v multi core
	  – Multiprocessor
	  – Distributed
	• Health and safety practices; mains electricity, hot components, lifting and carrying, electrostatic precautions.
	Learning Outcome: 1

Hardware	• Standard architecture
	  – CPU, main memory (RAM, ROM), Backing storage, I/O
	• Current implementation of standard architecture
	  – CPU, motherboard, Power supply, cooling, backing store (hard disk, optical disks), memory types, interfaces (PCI, AGP, PCI Express), NIC, graphics card, sound.
	• Inside a PC
	  – Identify components and their functions
	• Identify alternative components and packaging
	Learning Outcome: 1

Peripherals and System Building	• Printers, & plotters, cameras & scanners; keyboard, mouse, touch screen/pad; monitors, display adapters; multimedia devices; storage media; networking; portable drives; plug and play components; performance factors
	• Disassemble and assemble a computer system
	  – Install motherboard, processor, heat-sink and fan, memory, power supply unit
	  – Install hard disc drive, optical drive;
	  – Install specialised cards
	  – Install peripheral devices
	Learning Outcomes: 1 & 3

Software, Installation and Configuration	• Systems software
	  – Operating systems,
	  – Utility programmes,
	  – Library programmes,
	  – Translator programmes
	• Applications software
	  – Standard packages
	  – Customised packages
	  – Special purpose software
	  – Bespoke software
	• Install key software
	  – Windows Operating Systems
	  – Office package
	  – Free utility software
	  – Anti-virus and security software
	Learning Outcomes: 1 & 3

Alternative Operating Systems	• Alternative operating systems – UNIX/Linux, OS X, Android • Linux installation ***Learning Outcome: 1***
System Testing	• Test plan • Test documentation • Fault detection, diagnostics, troubleshooting • Technical support • Test hardware and software • Repair • Fault diagnosis exercises ***Learning Outcome: 3***
Software Maintenance	• Software problems • Automatic updates • Upgrades • Utility software • Security software • Scheduling maintenance • Windows update exercise • Package update exercise • Driver update ***Learning Outcome: 4***

Hardware Maintenance	• Preventative maintenance
	• Upgrade v replace
	• Hardware upgrade
	  – Priorities
	  – Internal components
	  – Peripherals
	• Hardware upgrade exercises e.g.
	  – Memory update
	  – Graphics upgrade
	  – Hard disk upgrade
	  – Add second NIC
	Learning Outcome: 4

File Management	• File systems operation and organisation
	  – FAT, NTFS, ext
	  – Directories/folders
	  – Security, sharing and access rights
	• Data Protection
	  – Backup
	  – File/folder organisation
	• Windows file management exercises
	Learning Outcome: 4

Needs Analysis	• Client and system requirements
	  – Investigation/analytical techniques
	  – Problems/limitations with current/new system
	  – Functionality, costs, timescales, resources
	• Case study
	  – Introduction
	  – Needs analysis exercise
	Learning Outcome: 2

Selection and Systems Specification	• Selection criteria
	• System integration
	• Accessibility
	• Alternative solutions
	  – Identification, selection & justification
	• Matching client requirements and system requirements with system components
	• Systems options
	  – Off the shelf, self build, customise
	  – Alternatives
	• System documentation
	• Case study – Selection & specification
	
	Learning Outcome: 2 & 3

Related National Occupational Standards (NOS)
Sector Subject Area: 6.1 ICT Professional Competence **Related NOS**: 4.1.A.1 – Contribute to IT architecture work; 4.1.A.2 – Gather, use and maintain information relating to IT architecture models; 4.8.A.1 – Prepare, under supervision, for IT/technology infrastructure design and planning activities; 4.8.A.2 – Assist with IT/technology infrastructure design and planning activities; 4.8.A.3 – Assist others with relevant information concerning IT/technology infrastructure design and planning assignments; 5.4.A.1 - Perform systems integration activities as directed; 5.4.P.2 - Perform systems integration activities.

Assessments
Local Examination (50%) Global Assignment (50%)
See also Section 3 above

5.4. Designing and Developing a Website

Title:	Designing and Developing a Website

RQF code:	L/601/3315	**Credits**	15	**Level**	4

Guided Learning Hours	90	**Total Qualification Time**	150

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Design a website to address loosely-defined requirements	1.1 Identify the key design features inherent within a requirements specification 1.2 Use planning tools and techniques to create a site map 1.3 Evaluate different design models and select the most appropriate to meet requirements.
2. Use web development tools to build (X)HTML- and CSS-based websites to address well-defined specifications	2.1 Describe the use of (X)HTML to develop websites 2.2 Describe how to use CSS to standardise the overall style of a website 2.3 Write the source code for a simple web page in clean XHTML according to a specification. 2.4 Write the source code for a CSS according to a specification 2.5 Explain the contextual application of a variety of web development tools 2.6 Explain the advantages and disadvantages of various web development methodologies and technologies
3. Understand the technology and tools needed to use multimedia in the context of a website	3.1 Explain the advantages and disadvantages of various types of multimedia file formats 3.2 Explain the advantages and disadvantages of different types of multimedia elements in relation to different contexts 3.3 Embed functional multimedia components in an (X)HTML site
4. Develop test strategies and apply these to a website	4.1 Develop and apply a test strategy consistent with the design 4.2 Determine expected test results 4.3 Record actual test results to enable comparison with expected results 4.4 Analyse actual test results against expected results to identify discrepancies 4.5 Investigate test discrepancies to identify and rectify their causes 4.6 Explain the need for testing on different platforms and browsers

5. Understand the need for Web standards	5.1 Explain the role of the W3C 5.2 Explain W3C standards and their application in site coding 5.3 Discuss web accessibility and usability issues from the viewpoint of an IT professional
6. Understand the concepts associated with using the Internet and the World Wide Web for business	6.1 Explain the underlying physical and operational properties of the Internet and World Wide Web, including the difference between the two 6.2 Discuss the Internet and the Web as a business tool, including (but not limited to) as a tool for communications, research, sales and marketing 6.3 Discuss the advantages and disadvantages of various internet-based models, in different contexts 6.4 Discuss the advantages and disadvantages of various eCommerce models, in different contexts

Syllabus Content	
Topic	**Course coverage**

Introduction to the Module	• What is the WWW?
	  ○ How the WWW works
	• The W3C and the importance of web standards
	• The challenges of web design:
	  ○ Browsers
	  ○ Screen resolution
	  ○ Accessibility
	  ○ Usability
	Learning Outcomes: 5 & 6

Introduction to (X)HTML	• Basic principles of markup: elements, tags and attributes
	• Document structure:
	  ○ Document Type Declarations
	  ○ The root element
	  ○ The head and body sections
	• Structuring text: heading, paragraphs and lists
	• Block level and inline elements
	• Validating documents
	Learning Outcome: 2

Hyperlinks	• Using the anchor element • Relative and absolute URLs • In-page hyperlinks • The HTML 5 nav element • Accessible hyperlinks ***Learning Outcomes: 2 & 6***

Introduction to Cascading Style Sheets (CSS)	• What is CSS, why do we need CSS? • Applying CSS: inline, embedded and external style sheets • Overview of CSS selectors, properties and values • Efficient CSS • Validating CSS • Developer tools ***Learning Outcome: 2***
Integrating Media	• Image file types • Inserting images • Image maps • Audio and video file types • The object tag • HTML 5 video and audio tags • Accessibility and media types ***Learning Outcomes: 2, 3 & 5***
HTML Tables	• Basic structure of HTML tables • Column and Row Spanning • Tables as a page layout device • CSS and tables • Accessibility and tables ***Learning Outcomes: 2 & 5***
HTML Forms	• Basic structure of HTML Forms • HTML Form elements • Accessibility and HTML forms • Controlling the layout of forms • HTML 5 form elements ***Learning Outcomes: 2 & 5***
Page Layout with CSS	• The class and id selectors • Floating and positioning • Fixed width and fluid page design • HTML 5 section elements • Page layout and mobile devices ***Learning Outcomes: 2 & 5***

Introduction to Web Design	• Understanding why an organisation needs a website:
	  ○ eBusiness models
	  ○ eCommerce models
	• The process of designing a website
	• Involving users in the design process
	• Defining content and functionality
	Learning Outcomes: 1 & 6

Navigation and Interface Design	• Site structure • Designing navigation • Interface Design ***Learning Outcomes: 1 & 5***
Evaluation and Testing	• Validating documents • Testing with a range of browsers • Testing with users • An iterative approach to development ***Learning Outcomes: 4 & 5***
Summary	• Summary and recap of previous units • Hosting a website • HTML 5, CSS 3 and the mobile web ***Learning Outcomes: All***

Related National Occupational Standards (NOS)
Sector Subject Area: 6.1 ICT Professional Competence **Related NOS:** 4.6.A.1 – Contribute to human interaction and interface (HCI) design activities; 4.6.A.2 – Assist, under supervision, with the progress of human interaction and interface (HCI) design assignments; 4.6.P.1 – Prepare for human interaction and interface (HCI) design activities; 4.6.P.2 – Implement, under supervision, human interaction and interface (HCI) design activities; 4.6.P.3 – Manage the needs of different users of HCI design activities; 4.6.S.1 – Plan human interaction and interface (HCI) design activities.

Assessments
Global Assignment (100%)
See also Section 3 above

5.5. Databases

Title:	Databases

RQF code:	T/502/8333	**Credits**	15	**Level**	4

Guided Learning Hours	60	**Total Qualification Time**	150

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Understand the concepts associated with database systems	1.1 Summarise the common uses of database systems 1.2 Explain the meaning of the term database 1.3 Explain the meaning of the term database management system (DBMS) 1.4 Describe the components of the DBMS environment 1.5 Describe the typical functions of a DBMS 1.6 Summarise the advantages and disadvantages of a DBMS
2. Understand the concepts associated with the relational model	2.1 Summarise the concept of the relational model 2.2 Explain the terminology associated with the relational model 2.3 Explain the purpose of relational integrity
3. Understand how to design and develop a database system	3.1 Explain the use of ER modelling in database design 3.2 Describe the basic concepts of an ER model 3.3 Describe ways of identifying problems in an ER model 3.4 Explain ways of solving problems in an ER model 3.5 Summarise the purpose of SQL 3.6 Describe how to create database tables using SQL
4. Be able to develop a logical database design	4.1 Identify a set of tables from an ER model 4.2 Check that the tables are capable of supporting the required transactions
5. Be able to develop a database system using SQL	5.1 Create database tables based on a data dictionary 5.2 Insert data into the tables 5.3 Update data in the tables 5.4 Delete data in the tables

Syllabus Content	
Topic	**Course coverage**
Introduction to the Module and Database Fundamentals	• Introduction to the module • What are databases? • Examples of databases in use • Data and information ***Learning Outcome: 1***
Databases and Database Management Systems (DBMS)	• Components of a database system • Types of applications • Database Management Systems • Available commercial implementations • History of information management • Pre-database information systems • Advantages of database approach and DBMS • Disadvantages of DBMS • Relational model and alternatives ***Learning Outcome: 1***
Entity Relationship (ER) Modelling (1)	• The goal of ER modelling • Types of notation • Basic concepts (entities, attributes and relationships) • Identifying entities ***Learning Outcome: 3***
Entity Relationship (ER) Modelling (2)	• Constructing ER models • Strong and weak entities • Identifying problems in ER models • Problem solving in ER models ***Learning Outcome: 3***
The Relational Model (1)	• Aims of the relational model • Basic concept of the relational model • Terminology ***Learning Outcome: 2***
The Relational Model (2)	• The purpose of relational integrity • Basic purpose and concepts of normalisation ***Learning Outcome: 2***
SQL (1)	• The purpose and role of SQL • Basic concepts of SQL • Standards and flavours of SQL ***Learning Outcome: 3***

SQL (2)	• Key constructs in SQL • Creating statements • Selecting statements • Fixing mistakes ***Learning Outcome: 3***
Database Design	• Understanding requirements • Identifying a set of tables from an ER model • The data dictionary • Use of CASE tools • Entities to tables ***Learning outcome: 4***
Supporting Transactions	• Identifying business rules • Checking a database will support the required transactions • Identifying possible performance issues • Indexing and de-normalisation ***Learning Outcome: 4***
Database Implementation	• The implementation environment • Creating tables based on database dictionary • Enforcing integrity via constraints • Enforcing business rules via constraints • Creating indexes • Insert, Update and Delete ***Learning Outcome: 5***
Summary	• Summary of module • Identifying links with other modules/subject areas • Clarification of module material and related issues as identified by students ***Learning Outcomes: ALL***

Related National Occupational Standards (NOS)
Sector Subject Area: 6.1 ICT Professional Competence **Related NOS:** 4.2.A.1 – Contribute to data analysis assignment; 4.2.A.2 – Carry out specified data analysis activities; 4.5.A.1 – Collate specified information relating to data design activities; 4.5.A.2 – Contribute to producing and maintaining data designs; 4.5.A.3 – Assist, under supervision, the management of data relating to data designs; 4.5.P.1 – Assist with the development for data design activities.

Assessments
Global Examination (50%) Global Assignment (50%)
See also Section 3 above

5.6. Designing and Developing Object-Oriented Computer Programs

Title:	Designing and Developing Object-Oriented Computer Programs

RQF code:	T/601/3308	**Credits**	15	**Level**	4

Guided Learning Hours	90	**Total Qualification Time**	150

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Design object-oriented programmes to address loosely-defined problems	1.1 Identify a set of classes and their interrelationships to address the problem 1.2 Make effective use of encapsulation, inheritance and polymorphism 1.3 Select and reuse pre-existing objects and templates specialising as required 1.4 Structure the design so that objects communicate efficiently 1.5 Specify the properties and behaviour of classes to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms 1.6 Record the design using well-established notations
2. Implement object-oriented programmes from well-defined specifications	2.1 Produce a working programme which satisfies the design specification 2.2 Make effective use of basic programming language features and programming concepts to implement a programme that satisfies the design specification 2.3 Make effective use of the features of the programming environment 2.4 Make effective use of user interface components in the implementation of the programme 2.5 Make effective use of a range of debugging tools
3. Develop object-oriented programs that reflect established programming and software engineering practice	3.1 Apply standard naming, layout and comment conventions 3.2 Apply appropriate data validation and error handling techniques
4. Develop test strategies and apply these to object-oriented programmes	4.1 Develop and apply a test strategy consistent with the design identifying appropriate test data 4.2 Apply regression testing consistent with the test strategy 4.3 Use appropriate tools to estimate the performance of the programme

5. Develop design documentation for use in program maintenance and end-user documentation	5.1 Record the final state of the programme in a form suitable for subsequent maintenance 5.2 Provide end-user documentation that meets the user's needs

Syllabus Content	
Topic	**Course coverage**
GUI and IDE	• Workbench and User Interfaces ***Learning Outcomes: 2 & 3***
Genesis and Structure of Java	• Recent History • Fundamental Facilities ***Learning Outcomes: 2 & 3***
Introduction to Object Orientation	• Classes • Objects • Encapsulation • Inheritance • Polymorphism ***Learning Outcomes: 1, 2 & 3***
The Graphics Class	• 2D Graphics Methods ***Learning Outcomes: 1, 2 & 3***
More Complex User Interfaces	• Range of swing components with some associated events ***Learning Outcomes: 1, 2 & 3***
Approaches to Design Methodology	• Elementary use of UML ***Learning Outcomes: 1, 2, 3 & 4***
Exception Handling	• Detection and correction of errors ***Learning Outcomes: 1, 2, 3, 4 & 5***
Creating Classes	• Programmer defined attributes, methods and events ***Learning Outcomes: 1, 2, 3, 4 & 5***
Data Structures	• Lists ***Learning Outcomes: 1, 2, 3, 4 & 5***
Data Files	• Serial text files ***Learning Outcomes: 1, 2, 3, 4 & 5***

Related National Occupational Standards (NOS)
Sector Subject Area: 6.1 ICT Professional Competence **Related NOS:** 5.1.A.1 - Carry out system development activities under direction; 5.1.P.1 - Perform systems development activities; 5.1.P.2 - Contribute to the management of systems development;

5.2.P.2 - Perform software development activities; 5.3.A.1 - Carry out IT/Technology solution testing activities under direction; 5.3.P.1 - Carry out IT/Technology solution testing.

Assessments
Global Assignment (100%)
See also Section 3 above

5.7. Software Development Techniques

Title:	Software Development Techniques

RQF code:	A/502/8334	**Credits**	15	**Level**	4

Guided Learning Hours	60	**Total Qualification Time**	150

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Identify and explain the key stages of software development lifecycles	1.1 Identify and describe the stages in traditional software lifecycle approaches 1.2 Explain why alternative software development lifecycles have been developed 1.3 Identify and explain the key features of modern approaches to software development
2. Express, design and evaluate algorithms	2.1 Express algorithms in a non-executable code 2.2 Develop algorithmic solutions to well-specified problems using appropriate notation 2.3 Evaluate algorithmic solutions with appropriately selected test data
3. Identify and use programming language constructs	3.1 Select and use variables and constants taking into account associated data type requirements 3.2 Select and use appropriate programming structures (sequence, selection and iteration)
4. Identify and use common data structures	4.1 Explain and use arrays 4.2 Explain and use common structures such as lists, queues and stacks
5. Explain and use common algorithms	5.1 Explain and use common algorithms for searching, sorting, parsing 5.2 Explain the efficiency criteria used to evaluate such algorithms
6. Explain and use test strategies	6.1 Develop and apply test strategies for well-defined algorithms 6.2 Identify and explain a range of methods used to test software
7. Explain how software is modularised	7.1 Explain procedural and object oriented programme structure 7.2 Demonstrate the use of programme structures using non-executable code

Syllabus Content	
Topic	**Course coverage**
Introduction to the Module and the Software Development Process	• Introduction to the module • Definition and design of simple algorithms • Introduction to the software development process • The history of software development ***Learning Outcomes: 1 & 2***
Introduction to the IDE and the Compilation Process.	• Overview of the Eclipse IDE • Introduction to the compilation process • An introduction to the virtual machine • Alternative models of execution ***Learning Outcomes: 1***
Variables and Data Representation	• Memory management in a computer system • Data types • Variable declaration and manipulation • Arithmetic operators ***Learning Outcomes: 3***
Iteration	• For loops • While loops • Do-While loops • Mathematical algorithms ***Learning Outcomes: 2 & 3***
Selection	• If • Else • Switch • Input validation ***Learning Outcomes: 3 & 6***
Object-Oriented Programming	• Classes • Instantiation • Value and Reference • Encapsulation ***Learning Outcomes: 3, 4 & 7***
Testing and Debugging	• Black box testing • White box testing • Unit testing • Integration testing ***Learning Outcomes: 6***

Programme Design	• Object design • Method design • Big O Notation • Coupling and Cohesion • Impact of Change ***Learning Outcomes: 4 & 7***
Arrays	• Declaration of arrays • Manipulation of arrays • Application of arrays • Two dimensional arrays ***Learning Outcomes: 3 & 4***
Strings	• Declaring strings • Manipulating strings • Searching strings • Parsing strings ***Learning Outcomes: 3, 4 & 5***
Array Data Structures	• Lists • Stacks • Queues • Sorting ***Learning Outcomes: 4 & 5***
Summary and Conclusion	• Summary of module • Contextualisation of concepts • Clarifications • Further reading ***Learning Outcomes: All***

Related National Occupational Standards (NOS)
Sector Subject Area: 6.1 ICT Professional Competence **Related NOS:** 4.4.A.1 – Assist with the development for systems analysis activities; 4.4.A.2 – Operate, under supervision, systems analysis activities; 4.4.P.1 – Prepare, under supervision, for a systems analysis assignment; 4.7.A.1 – Follow, under supervision, the organisation's procedures for informing systems design activities; 4.7.A.2 – Carry out, under supervision, specified systems design activities; 4.7.A.3 – Document, under supervision, specified information relating to system/solution/service designs; 5.2.A.1 - Assist with the management of software development activities; 5.2.A.2 - Carry out software development activities under direction; 5.2.P.3 - Control software development activities; 5.3.A.1 - Carry out IT/Technology solution testing activities under direction; 5.3.P.1 - Carry out IT/Technology solution testing.

Assessments
Global Examination (100%)
See also Section 3 above

5.8. Office Solutions Development

Title:	Office Solutions Development

RQF code:	R/601/1971	**Credits**	15	**Level**	4

Guided Learning Hours	60	**Total Qualification Time**	150

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Understand how application software can support business processes	1.1 Discuss ways in which application software can support business processes 1.2 Justify the use of different application software to support a given user requirement or business process 1.3 Discuss the importance of addressing both user and business requirements
2. Be able to design and implement office solutions	2.1 Design a solution to address a business or user need 2.2 Use advanced tools and techniques to implement a solution 2.3 Test a solution against expected results
3. Be able to demonstrate that business processes have been enhanced/improved	3.1 Discuss ways in which end user engagement has taken place 3.2 Provide evidence that business processes have been enhanced/improved 3.3 Evaluate possible further improvements that could be made to enhance the system

Syllabus Content	
Topic	**Course coverage**
Application Software and Business Processes	• An Introduction to the module • Types of business processes and functions • Application software defined • Types and range of application software • How application software supports business processes • Research into examples of commercial software • Evaluation of the role of applications software in specific business contexts • Case studies • Glossary ***Learning Outcome: 1***

An Introduction to End User Software Development	• End-User defined • Examine the need to address both user and business requirements • Interface defined • Identify Interface Design principles and good practice • Microsoft Office interface development • Case studies • Glossary ***Learning Outcome: 1***
An Introduction to the Advanced Features and Functions of the Microsoft Office Suite	• An introduction to the Microsoft Office suite • An overview of advanced features and functions • How the above improve business performance • Consideration of both user and business requirements • Application of interface design principles • Glossary ***Learning Outcomes: 1 & 2***
Advanced Features and Functions of Microsoft Access, Excel and Word	• An overview of advanced features and functions in Access • An overview of advanced features and functions in Excel • An overview of advanced features and functions in Word • Glossary ***Learning Outcome: 2***
An Introduction to VBA and Macros	• Define what is meant by a macro • Define what is meant by VBA • Explain that there is a range of macros used for different purposes • Describe the methods that can be used to develop macros • Explain the issues of macros and security • Use the Visual Basic Editor to create macros • Use the Record Macro feature • Save macros • Edit macros ***Learning Outcome: 2***
Using Macros in Microsoft Word	• Develop macros • Edit macros • Use the Macro Recorder • Assign a macro to the keyboard • Assign a macro to a button • Format text or pictures using macros • Customise headers and footers using macros • Secure documents against malicious macros ***Learning Outcome: 2***

Using Macros in Microsoft Access	• Create a macro in Microsoft Access • Understand key macro terms • Explain the sequence of macro production • Create Autoexec macros • Input data using a macro • Validate data using a macro • Filter and find records using a macro • Print records using a macro • Assign a macro to a command button • Navigate between forms and records using a macro • Run a query using a macro • Secure documents against malicious macros ***Learning Outcome: 2***
Using Macros in Microsoft Excel - 1	• Create a macro in Microsoft Excel • Format titles, formulas and tables • Input dates and times • Input and select data using a macro • Provide data validation using a macro • Design message boxes and feedback • Design interactive user forms ***Learning Outcome: 2***
Using Macros in Microsoft Excel - 2	• Create a macro that uses absolute cell references • Create a macro that uses relative cell references • Create an icon to run a macro • Print data using a macro • Secure documents against malicious macros ***Learning Outcome: 2***
Testing Software Development	• The need for testing • Types of testing • The Test Plan • Determine expected test results • Record actual test results to enable comparison with expected results • Analyse actual test results against expected results to identify discrepancies • Investigate test discrepancies to identify and rectify their causes • Testing Checklist • Glossary ***Learning Outcome: 2***

Evaluating Software Development	• Types of evaluation • Functionality evaluated • Efficiency evaluated • Reliability evaluated • Usability evaluated • Identify successful user interaction • Identify enhancements • Identify potential improvements • Evaluation Checklist • Glossary ***Learning Outcome: 3***
Combining End User Software Development, Testing and Evaluation	• Topic Scenario • Identify business processes • Identify application software • Identify good practice in software interface design • Use advanced features and functions in Microsoft Excel and Word • Use macros in Microsoft Excel and Word • Produce a test plan • Produce an evaluation checklist ***Learning Outcomes: 1, 2 & 3***

Related National Occupational Standards (NOS)
Sector Subject Area: 6.1 ICT Professional Competence **Related NOS**: 4.6.A.1 – Contribute to human interaction and interface (HCI) design activities; 4.6.A.2 – Assist, under supervision, with the progress of human interaction and interface (HCI) design assignments; 4.6.P.1 – Prepare for human interaction and interface (HCI) design activities; 4.6.P.2 – Implement, under supervision, human interaction and interface (HCI) design activities; 4.6.P.3 – Manage the needs of different users of HCI design activities; 4.6.S.1 – Plan human interaction and interface (HCI) design activities; 5.1.A.1 - Carry out system development activities under direction; 5.1.P.1 - Perform systems development activities; 5.1.P.2 - Contribute to the management of systems development; 5.2.P.2 - Perform software development activities; 5.3.A.1 - Carry out IT/Technology solution testing activities under direction; 5.3.P.1 - Carry out IT/Technology solution testing.

Assessments
Local Examination (50%) Global Assignment (50%)
See also Section 3 above

6. Results and Certificates

The grade descriptors Pass, Merit and Distinction are awarded by Unit to successful candidates. A Pass is awarded for an overall Unit mark of between 40 and 59. A Merit is awarded for an overall Unit mark of between 60 and 69 and a Distinction is awarded for an overall Unit mark of 70 and above. Candidates who obtain an overall Unit mark of below 40 are classed as *failed* in the Unit and may resit.

Grade Descriptors incorporate characteristics intended to provide a general indication of assessment performance in relation to each Unit's Learning Outcomes in this specification. The final Unit grade awarded will depend on the extent to which a candidate has satisfied the Assessment Criteria. A qualification is awarded when the candidate has achieved at least a pass in all Units.

After each assessment cycle, results slips are issued (in electronic format) which detail the grades achieved, i.e. Fail, Pass, Merit or Distinction (see *Appendix 2*). Certificates are then dispatched to Centres.

7. Further Information

For more information about any of NCC Education's products please contact customer.service@nccedu.com or alternatively please visit www.nccedu.com to find out more about our suite of high-quality British qualifications.

Appendix 1 Qualification Documentation

The following NCC Education documentation has been referred to in this specification:

- Reasonable Adjustments and Special Considerations Policy
- Examination Guidelines
- Moderation Manual
- Activity Schedule
- Operations Manual

All documentation, together with access to NCC Education's online resources, is available to Centres and (where applicable) candidates who have registered for assessment.

Appendix 2 Grade Descriptors

The grade descriptors Pass, Merit and Distinction are awarded to successful candidates. The following are characteristics intended to provide a general indication of assessment performance in relation to each Learning Outcome in this specification. The final grade awarded will depend on the extent to which a candidate has satisfied the Assessment Criteria overall and it should be noted that weaknesses in some aspects of an assessment can be balanced by strong performance in other areas.

Grade descriptors for Office Solutions Development

Learning Outcome	Pass	Merit	Distinction
Understand how application software can support business processes	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Be able to design and implement office solutions	Provide adequate design to address the specification	Provide detailed and appropriate design to address the specification	Provide wholly appropriate and innovative design that meets the specification
Be able to demonstrate that business processes have been enhanced/improved	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard

Grade descriptors for Software Development Techniques

Learning Outcome	Pass	Merit	Distinction
Identify and explain the key stages of software development lifecycles	Provide adequate ability to explain the subject matter	Provide detailed and coherent explanation of the subject matter	Provide comprehensive, lucid explanation of the subject matter
Express, design and evaluate algorithms	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Identify and use programming language constructs	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Identify and use common data structures	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard

Learning Outcome	Pass	Merit	Distinction
Explain and use common algorithms	Demonstrate adequate ability to explain the subject matter; Demonstrate adequate and appropriate use	Demonstrate detailed and coherent explanation of the subject matter; Demonstrate appropriate and effective use	Demonstrate comprehensive, lucid explanation of the subject matter; Demonstrate highly appropriate and effective use
Explain and use test strategies	Demonstrate adequate ability to explain the subject matter; Demonstrate adequate and appropriate use	Demonstrate detailed and coherent explanation of the subject matter; Demonstrate appropriate and effective use	Demonstrate comprehensive, lucid explanation of the subject matter; Demonstrate highly appropriate and effective use
Explain how software is modularised	Provide adequate ability to explain the subject matter	Provide detailed and coherent explanation of the subject matter	Provide comprehensive, lucid explanation of the subject matter

Grade descriptors for Designing and Developing Object Oriented Computer Programs

Learning Outcome	Pass	Merit	Distinction
Design object-oriented programmes to address loosely-defined problems	Provide adequate design to address the specification	Provide detailed and appropriate design to address the specification	Provide wholly appropriate and innovative design that meets the specification
Implement object-oriented programmes from well-defined specifications	Provide adequate design to address the specification	Provide detailed and appropriate design to address the specification	Provide wholly appropriate and innovative design that meets the specification
Develop object-oriented programmes that reflect established programming and software engineering practice	Show adequate development	Show sound and appropriate development	Show innovative and highly appropriate development
Develop test strategies and apply these to object-oriented programmes	Show adequate development and application of testing strategies	Show sound and appropriate development and application of testing strategies	Show innovative and highly appropriate development and application of testing strategies
Develop design documentation for use in program maintenance and end-user documentation	Show adequate development of materials	Show sound and appropriate development of materials	Show innovative and highly appropriate development of materials

Grade descriptors for Databases

Learning Outcome	Pass	Merit	Distinction
Understand the concepts associated with database systems	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the concepts associated with the relational model	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand how to design and develop a database system	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Be able to develop a logical database design	Show adequate development	Show sound and appropriate development	Show innovative and highly appropriate development
Be able to develop a database system using SQL	Show adequate development	Show sound and appropriate development	Show innovative and highly appropriate development

Grade descriptors for Designing and Developing a Website

Learning Outcome	Pass	Merit	Distinction
Design a website to address loosely-defined requirements	Provide adequate design to address the specification	Provide detailed and appropriate design to address the specification	Provide wholly appropriate and innovative design that meets the specification
Use web development tools to build (X)HTML- and CSS-based websites to address well-defined specifications	Demonstrate adequate and appropriate ability to build artefact	Demonstrate sound and consistently appropriate ability to build artefact	Demonstrate exceptional ability to build artefact
Understand the technology and tools needed to use multimedia in the context of a website	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Develop test strategies and apply these to a website	Show adequate development	Show sound and appropriate development	Show innovative and highly appropriate development
Understand the need for Web standards	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the concepts associated with using the Internet and the World Wide Web for business	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding

Grade descriptors for Computer Systems

Learning Outcome	Pass	Merit	Distinction
Understand the function of computer systems	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Be able to design computer systems	Provide adequate design to address the specification	Provide detailed and appropriate design to address the specification	Provide wholly appropriate and innovative design that meets the specification
Be able to build and configure computer systems	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Be able to undertake routine maintenance on computer systems	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard

Grade descriptors for Computer Networks

Learning Outcome	Pass	Merit	Distinction
Understand network and communication protocols	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the principles of common network topologies and architectures	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the application of network security measures	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Be able to select and configure the hardware components of a computer network to meet the requirements of a precise specification	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Be able to design and install network and server operating systems to meet the requirements of a precise specification	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Be able to install and configure internet telephony and communication systems	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard

Grade descriptors for Skills for Computing

Learning Outcome	Pass	Merit	Distinction
Be able to use various skills to support the study of Computing	Draw upon and make use of an adequate range of skills	Draw upon a variety of skills and make an appropriate selection	Draw upon a wide range of skills and make a highly appropriate selection
Be able to communicate in a technical environment	Demonstrate adequate standard of communication	Demonstrate strong and consistent standard of communication	Demonstrate highly skilful, exemplary standard of communication
Be able to deploy thinking skills and problem-solving paradigms in both a business and learning context.	Demonstrate adequate deployment of skills and paradigms	Demonstrate sound and appropriate deployment of skills and paradigms	Demonstrate highly effective deployment of skills and paradigms
Be able to handle and present data	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Understand the need for lifelong learning	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding