QUALIFICATION HANDBOOK

Level 2 Certificate for Software Developers (7650-12)

November 2016 Version 5.0

City & Guilds

Qualification at a glance

Subject area	**Software Developers**
City & Guilds number	7650
Age group approved	14+
Entry requirements	None
Assessment	Assignment, Multiple Choice test
Fast track	Refer to page 6 for further details
Support materials	Assignments
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number	Accreditation number
Level 2 Certificate for Software Developers	7650-12	600/7064/X

Version and date	Change detail	Section
3.0 November 2015	Unit 202 – LO 3 added Unit 203 - AC 2.3, 2.4, LO 3 added Unit 204 - LO 3 added Unit 206 - AC 2.6, 2.7, LO 3, LO 4 added Unit 207 – range added Unit 208 - LO 3 and range added Unit 209 - LO 4 added Unit 220 - URN corrected, AC 2.2, 2.3, 2.4, 2.5, 2.6, LO 3 added Unit 221 - LO 3 and range added Unit 301 - AC 2.4, 2.5 added	Units
5.0 November 2016	Corrections to grading of units 220 and 221	Assessments

Contents

1 Introduction

This section tells you what you need to do to deliver the qualification:

Area	Description
Who is the qualification for?	For learners who want to work in a software development environment including school learners wishing to gain skills to progress to further learning or employment, as well as those in employment looking for a change of career or certificating their ability.)
What does the qualification cover?	It allows learners to learn, develop and practise the skills and knowledge that would enable them to seek employment as a trainee or junior programmer, developing software applications that may include games or mobile applications.
Is the qualification part of a framework or initiative?	It serves as technical certificate, in the IT, Software and Telecommunications Apprenticeship framework.
What opportunities for progression are there?	It provides a number of progression opportunities for learners: • level 3 Software Development to enable them to acquire a range of high level IT skills relevant to their chosen career paths and aspirations • Intermediate Apprenticeship (England)/Foundation Apprenticeship (Wales) in IT, Software, Web and Telecoms (Level 2) • Advanced Apprenticeship (England)Apprenticeship (Wales) in IT, Software, Web and Telecoms (Level 3)

Structure

To achieve the **Level 2 Certificate for Software Developers (7650-12)**, learners must achieve **16** credits in total. **3** credits must be achieved from the Mandatory Group. **7** credits must be achieved from Optional Group A and a minimum of **6** credits must be achieved from Optional Group B.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value
Mandatory			
M/504/5261	200	Principles of designing and developing software	3
Optional Group A			
A/601/3181	202	Creating an object orientated computer program	7
T/601/3177	203	Creating an event driven computer program	7
L/601/3167	204	Creating a procedural computer program	7
Optional Group B			
A/502/1108	205	Business concepts 2	4
D/601/3206	206	Data representation and manipulation for IT	7
J/601/3510	207	Software testing	6
R/601/3512	208	Web fundamentals	7
T/601/8296	209	Customer support provision 2	9
R/502/4631	220	Website software	4
M/502/4555	221	Database software	4
L/601/3251	301	Software design fundamentals	10

2 Centre requirements

Approval

To offer these qualifications, new centres will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Existing centre

Centres that have or are offering the following qualifications can request Fast Track approval to this qualification:

- Level 2 Diploma in Software Development (7266-22)
- Level 2 Award/Diploma in Systems and Principles (7540-12)
- Level 2 Certificate/Diploma in Systems Support (7540-12)
- Level 2 Diploma in ICT Professional Competency (4520-02)
- Level 2 Advanced Diploma in Software Development (7266-23)
- Level 3 Certificate/Diploma in Systems and Principles (7540-13)
- Level 3 Diploma in Systems Support (7540-13)
- Level 3 Diploma in ICT Professional Competency (4520-03)
- Level 4 Diploma in Systems and Principles (7630-03)
- Level 4 Diploma in ICT Professional Competency (4520-04)

New centre

Centres who wish to offer this qualification must use the standard Qualification Approval Process.

Resource requirements

Centre staffing

It is important that centre staff involved in the delivery or internal verification of this qualification have the appropriate knowledge and skills to ensure its effective delivery.

Staff delivering this qualification must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be technically competent and knowledgeable in the areas for which they are delivering training, and must be at least to the same level as the training being delivered.
- preferably hold a Level 3 ICT Professionals qualification relevant to the subject area

- have recent relevant experience in the specific area they will be assessing
- have credible experience of providing training with a relevant teaching qualification.

Centre staff may undertake more than one role, e.g. tutor and assessor or internal verifier, but must never internally verify their own assessments.

Assessors and internal verifiers

While the Assessor/Verifier (A/V) units are valued as qualifications for centre staff, they are not currently a requirement for the qualification.

However, it is strongly recommended that Assessors and Verifiers hold these qualifications or equivalent if they are going to be involved in writing and approving centre set and marked assignments.

Expert Witnesses

If additional experts involved in the delivery of this qualification do not have the necessary teaching qualifications or experience, it will be necessary for any assessment they undertake to be re-assessed by a qualified member of staff and form part of the centres internal quality process.

Continuing professional development (CPD)

Centres are expected to support their staff in ensuring that their knowledge remains current of the occupational area and of best practice in delivery, mentoring, training, assessment and verification, and that it takes account of any national or legislative developments.

Learner entry requirements

Learners should not be entered for a qualification of the same type, content and level as that of a qualification they already hold.

There are no formal entry requirements for learners undertaking this qualification. However, centres must ensure that learners have the potential and opportunity to successfully gain the qualification.

Age restrictions

This qualification is not approved for use by learners under the age of 14, and City & Guilds cannot accept any registrations for learners in this age group.

3 Delivering the qualification

Initial assessment and induction

An initial assessment of each learner should be made before the start of their programme to identify:

- if the learner has any specific training needs,
- support and guidance they may need when working towards their qualification.
- any units they have already completed, or credit they have accumulated which is relevant to the qualification.
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the learner fully understands the requirements of the qualification[s], their responsibilities as a learner, and the responsibilities of the centre. This information can be recorded on a learning contract.

Recommended delivery strategies

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification before designing a course programme.

Centres may design course programmes of study in any way which:

- best meets the needs and capabilities of their learners
- satisfies the requirements of the qualification.

In terms of the delivering the qualification, the emphasis is expected to be on the relationship between the content of the unit and the demands made on the individual by their existing or future job and career aspirations.

When designing and delivering the course programme, centres might wish to incorporate other teaching and learning that is not assessed as part of the qualification. This might include the following:

- literacy, language and/or numeracy
- personal learning and thinking
- personal and social development
- employability

Where applicable, this could involve enabling the learner to access relevant qualifications covering these skills.

Support materials

The following resources are available for this qualification:

Description	How to access
Assignments	www.cityandguilds.com

4 Assessment

Assessment of the qualification

The units within this qualification are assessed in the following ways:

- City & Guilds set assignments
- Multiple choice test (Evolve)

The table below indicates the assessment method for each unit.

Unit Number	Unit Title	Assessment Method	Grading Method
200	Principles of designing and developing software	City & Guilds multiple-choice test (evolve)	P/X
202	Creating an object orientated computer program	Assignment	P/M/D
203	Creating an event driven computer program	Assignment	P/M/D
204	Creating a procedural computer program	Assignment	P/M/D
205	Business concepts 2	Assignment	P/M/D
206	Data representation and manipulation for IT	Assignment	P/M/D
207	Software testing	Assignment	P/M/D
208	Web fundamentals	Assignment	P/M/D
209	Customer support provision 2	Assignment	P/M/D
220	Website software	Assignment	P/X
221	Database software	Assignment	P/X
301	Software design fundamentals	Assignment	P/M/D

Assignments can be found on the City & Guilds website.

Test specifications

The multiple choice examination can only be passed by candidates achieving 60% or above. This passmark may be subject to slight variation to ensure fairness should any variations in the difficulty of the examinations be identified.

The way the knowledge is covered the examination is laid out in the tables below:

Test: Principles of designing and developing software
Duration: 1 hour

Unit	Outcome	Number of questions	%
200	1 Understand the features of software development	8	27
	2 Know the common features of high level programming languages	9	30
	3 Know data types and structures	13	43
	Total	**30**	**100**

Assessment undertaken other than assignments provided by City & Guilds must also take into account the additional information provided in the unit Purpose and Aims relating to the level of demand of:

- the activity, task, problem or question and the context in which it is set
- the information input and output type and structure involved
- the IT tools, techniques or functions to be used

Note: The need for assessment other than the assignments provided need to be discussed with the Quality Consultant and the reasons for their use agreed in advance. There is no choice of assessment method for the **Mandatory Unit (Principles of designing and developing software)**.

Mandatory unit assessment

In order to reflect the standards of competence expected by employers, assessment of the mandatory unit (Principles of designing and developing software) learners must undertake the Evolve test that is externally set and marked by City & Guilds.

Optional unit assessment

City & Guilds provides the following to help with assessments:

- Paper based assignments for units can be found at **www.cityandguild.com**

Time constraints

The following time constraints must be applied to the assessment of these qualifications:

- Each assignment provided by City & Guilds for 7650 has a stated time within which a candidate should be able complete it. These are suggested timings and a Centre should make the judgement for extension based on their knowledge of their candidates. The suggested timings for each level are as follows:
    - Level 1: 1 ½ hours
    - Level 2: 2 hours
    - Level 3: 2 ½ hours
- Centres finding that assignments are taking longer, should contact the qualification consultant for guidance
- All assignments must be completed and assessed within the candidate's period of registration. Centres should advise candidates of any internal timescales for the completion and marking of individual assignments
- Centre staff should guide candidates to ensure excessive evidence gathering is avoided for portfolios
- Centre staff should cross reference evidence where appropriate

Assignments

Only assignments developed or approved for use by City & Guilds are acceptable as evidence for completion of units for this qualification.

Where a Centre devised assignment is approved, City & Guilds reserve the right to make this part of their public offering through the City & Guilds website.

Evidence requirements

Centres may provide evidence using anyone of the assessment methods listed above in this section. Where a centre requires clarification of an assessment method or wishes to use an alternative to those listed they should contact their Qualification Consultant through the City & Guilds Regional Office.

If agreed by the Quality Consultant in advance and valid reasons can be shown, evidence for units can be gathered from:

- activities undertaken in the classroom or at work (where these are not tutor lead)
- learning and studying subjects other than IT
- exercises and scenarios designed for the purpose of assessment

There will be times when, in order to provide evidence it will be appropriate for a candidate to take a 'screenshot' (a copy of the screen).

This need not be printed out, but can be copied from the clipboard into a word processing or presentation graphics document and saved to an appropriate area, where applicable commentary can be added.

By the very nature of IT, activities can be carried out in a variety of locations not confined to the traditional classroom or workplace setting.

Grading

The qualification grade (Pass/Merit/Distinction) is determined by the grade achieved from assignments 202, 203 or 204. Each of these assessments involve candidates creating a computer program.

5 Units

Structure of units

The units in these qualifications are written in a standard format and comprise the following:

- City & Guilds reference number
- title
- level
- credit value
- unit aim
- statement of guided learning hours
- information on assessment
- learning outcomes in detail expressed as practical skills and/ or underpinning knowledge
- range: the words in bold are listed as headings at the end of the unit. This content must be covered in the delivery of the unit. Where e.g. is used, this is indicative content that could be covered or replaced by other, similar material. It is not a requirement that all of the content is assessed. In some cases, additional guidance is provided in relation to the breadth and depth of coverage of range.

Unit 200 Principles of designing and developing software

UAN:	**M/504/5261**
Level:	Level 2
Credit value:	3
GLH:	30
Aim:	The aim of this unit is to provide the underpinning knowledge required for designing and developing specific software applications and their components.

Learning outcome
The learner will: 1. understand the features of software development
Assessment criteria
The learner can: 1.1 describe the **purpose** of software development in business 1.2 describe the main stages of the software development **life cycle** 1.3 describe the **techniques** used in software design 1.4 state the importance of using consistent naming conventions and standards in programming 1.5 state the **importance of documenting** software development and testing activities 1.6 describe the **health and safety** to ensure safe working practices.

Range
purpose systems to hold and deal with large information/data, to enable efficient management of common tasks, analyse and report on information **life cycle** definition of scope, requirements specification, design, coding, testing, implementation, maintenance **techniques** physical software design, data and HCI design, structure diagrams, DFDs. ERM, algorithms (using pseudo code, structured English, flowcharts) **importance of documenting** usability, to allow further development, maintenance, updates, team collaboration, portability, robustness, efficiency **health and safety** precautions - physical safety, use of equipment, electrical connections legislation – may include Health and Safety at Work Act (HASAWA) or relevant local/national guidelines

Learning outcome
The learner will: 2. know the common features of high-level programming languages
Assessment criteria
The learner can: 2.1 identify the main types of programming languages 2.2 identify the **factors** that influence selection of programming language 2.3 describe the features of programming languages 2.4 describe the programming **constructs** used in software development 2.5 describe the use of relational and logical **operators.**

Range
factors purpose, platform, availability, skills, reliability, cost, maintenance, development environment, simplicity of use and understanding, portability, compatibility **constructs** decision structures: sequence, selection, iteration **operators** relational: less than, more than logical: And, Or, Not

Learning outcome
The learner will: 3. know data types and structures
Assessment criteria
The learner can: 3.1 identify the **data types** used in programming 3.2 describe how **variables are used** in data representation and manipulation 3.3 describe how **subroutines are used** in programming 3.4 describe how data can be read from and written to a file.

Range
data types integer, floating point, character, Boolean Composite types (record, array), Abstract types (string, list, tree) **variables are used** for data storage, manipulation in formulae and expressions with operators, programme control and passing parameters **subroutines are used** functions, procedures, passing parameters by value, by reference

Unit 202 Creating an object orientated computer program

UAN:	**A/601/3181**
Level:	Level 2
Credit value:	7
GLH:	60
Aim:	This unit introduces the fundamental concepts of object oriented computer languages and their use to implement, refine and test a computer program.

Learning outcome
The learner will: 1. implement software using object orientated programming
Assessment criteria
The learner can: 1.1 select, declare and initialise variable and data structure types and sizes to meet given requirements 1.2 define relationships between objects 1.3 implement object behaviours using control structures 1.4 declare file structures 1.5 use standard input/output commands 1.6 use operators and predefined functions 1.7 make effective use of an Integrated Development Environment (IDE).

Learning outcome
The learner will: 2. refine an object orientated program to improve quality
Assessment criteria
The learner can: 2.1 follow an agreed standard for naming, comments and code layout 2.2 implement data validation for inputs 2.3 implement opportunities error handling and reporting 2.4 create on-screen help to assist the users of a computer program.

Learning outcome
The learner will: 3. test the operation of an object oriented driven program

Assessment criteria
The learner can: 3.1 use of the debugging facilities available in the IDE 3.2 determine expected test results from given test data 3.3 compare actual results against expected results to identify discrepancies.

Unit 203 Creating an event driven computer program

UAN:	**T/601/3177**
Level:	Level 2
Credit value:	7
GLH:	60
Aim:	This unit introduces the fundamental concepts of event driven computer languages and their use to implement, refine and test a computer program.

Learning outcome
The learner will: 1. implement software using event driven programming
Assessment criteria
The learner can: 1.1 declare and initialise variable and data structure types and sizes to implement given requirements 1.2 assign properties to screen components 1.3 associate events, including parameter passing, to screen components 1.4 implement event handling using control structures 1.5 declare file structures 1.6 use standard input/output commands to implement design requirements 1.7 use of operators and predefined functions 1.8 use an Integrated Development Environment (IDE).

Learning outcome
The learner will: 2. refine an event driven program to improve quality
Assessment criteria
The learner can: 2.1 follow an agreed standard for naming, comments and code layout 2.2 implement data validation for inputs 2.3 Implement error handling and reporting 2.4 create documentation for the support and maintenance of a computer program.

Learning outcome

The learner will: 3. test the operation of an event driven program
Assessment criteria
The learner can: 3.1 use the debugging facilities available in the IDE 3.2 determine expected test results from given test data 3.3 compare actual test results against expected results to identify discrepancies.

Unit 204 Creating a procedural computer program

UAN:	**L/601/3167**
Level:	Level 2
Credit value:	7
GLH:	60
Aim:	This unit introduces the fundamental concepts of procedural computer languages and their use to implement, refine and test a computer program.

Learning outcome
The learner will: 1. implement software using procedural programming
Assessment criteria
The learner can: 1.1 select, declare and initialise variable and data structure types and sizes to meet given requirements 1.2 implement control structures 1.3 declare file structures 1.4 use standard input/output commands 1.5 use operators and predefined functions 1.6 correctly use parameter passing mechanisms.

Learning outcome
The learner will: 2. refine a procedural programme to improve quality
Assessment criteria
The learner can: 2.1 follow an agreed standard for naming, comments and code layout 2.2 implement data validation for inputs 2.3 implement error handling and reporting 2.4 create documentation to assist the users of a computer programme 2.5 use available debugging tools.

Learning outcome
The learner will: 3. test the operation of a procedural programme

Assessment criteria
The learner can: 3.1 use available debugging tools 3.2 determine expected test results from given test data 3.3 compare actual test results against expected results to identify discrepancies.

Unit 205 Business concepts 2

UAN:	**A/502/1108**
Level:	Level 2
Credit value:	4
GLH:	30
Aim:	The aim of this unit is to understand how different types of organisations are affected by different functions, factors, financial and legal requirements

Learning outcome
The learner will: 1. know different types of organisations and the key functions within them
Assessment criteria
The learner can: 1.1 identify different types of organisations 1.2 identify key functions that are required within organisations 1.3 identify the structure of an organisation.

Learning outcome
The learner will: 2. understand how the external environment creates the need for organisations to change
Assessment criteria
The learner can: 2.1 provide evidence of external factors affecting an organisation 2.2 identify an external factor as an opportunity or threat.

Learning outcome
The learner will: 3. be able to describe the main legal and regulatory issues for organisations
Assessment criteria
The learner can: 3.1 identify some of the actions that organisations can take to comply with the Data Protection Act.

Learning outcome
The learner will: 4. know the essential financial operations within organisations
Assessment criteria
The learner can: 4.1 identify the costs and benefits in a cost benefit analysis table 4.2 create a cost benefits analysis table in a given scenario 4.3 identify the payback period 4.4 calculate the return on investment using a given formulae.

Unit 206 Data Representation and Manipulation for IT

UAN:	**D/601/3206**
Level:	Level 2
Credit value:	7
GLH:	60
Aim:	The aim of this is to introduce numbers in computing and how maths can be used in computing, in real terms.

Learning outcome
The learner will: 1. manipulate real numbers and integers
Assessment criteria
The learner can: 1.1 describe the difference between real numbers and integers 1.2 express numbers in power and scientific notation 1.3 perform arithmetic on numbers in power and scientific notation including multiplication and division or powers 1.4 round real numbers and estimate the resulting error 1.5 describe how real numbers and integers are represented I n computer memory.

Learning outcome
The learner will: 2. use co-ordinate systems and vectors, and linear transformations
Assessment criteria
The learner can: 2.1 describe two dimensional co-ordinate systems 2.2 represent simple shapes by finding the co-ordinates of the vertices 2.3 describe vectors 2.4 produce the polar representation of vectors 2.5 offset and scale shapes described by co-ordinates. 2.6 convert between linear to polar co-ordinates 2.7 describe co-ordinate systems used in programming output devices.

Learning outcome
The learner will: 3. use simple functions and basic algebraic operations

Assessment criteria
The learner can: 3.1 express simple problems as mathematical equations 3.2 simplify and change the subject of simple equations 3.3 describe the concept of a function 3.4 obtain the equation of a straight line from a graph 3.5 describe the basic properties of a circle and triangle. 3.6 apply trigonometric and inverse trigonometric functions.

Learning outcome
The learner will: 4. apply Boolean algebra to problem situations
Assessment criteria
The learner can: 4.1 describe how Binary states can be used to represent physical systems 4.2 identify and label the inputs and outputs of a binary representation 4.3 produce a truth table corresponding to a binary representation 4.4 express a truth table as a Boolean equation 4.5 simplify a Boolean equation using algebraic methods.

Unit 207 Software testing

UAN:	**J/601/3510**
Level:	Level 2
Credit value:	6
GLH:	30
Aim:	This unit introduces the basics of testing strategies and techniques and their application.

Learning outcome
The learner will: 1. know about testing strategies and techniques
Assessment criteria
The learner can: 1.1 identify the purpose of unit, integration and system testing of software 1.2 identify the stages of system testing including alpha, beta and acceptance testing 1.3 state the difference between functional (black box) and structural (white box) testing 1.4 describe the contents of a software test plan.

Range
1.3 code samples should be provided in order to perform suitable tests

Learning outcome
The learner will: 2. contribute to a test process for a software solution
Assessment criteria
The learner can: 2.1 identify test cases from a software test plan 2.2 identify the test data and expected results for test cases 2.3 effectively carry out the actions specified in test cases 2.4 accurately record results generated by test actions 2.5 compare and report on actual and expected test results.

Unit 208 Web fundamentals

UAN:	**R/601/3512**
Level:	Level 2
Credit value:	7
GLH:	60
Aim:	The aim of this unit is to introduce learners to the functions of websites allowing them to fully understand how they operate on a network and the Internet

Learning outcome
The learner will: 1. know web architecture and components
Assessment criteria
The learner can: 1.1 list the hardware and software components which enable the internet and web 1.2 state the role of TCP/IP protocol 1.3 state the role of internet service providers, web hosting services and domain name registrars 1.4 identify available types of web functionality.

Range
1.1 a full list of components should be described covering as much of the ISO 7 layer model as possible

Learning outcome
The learner will: 2. know about the technologies used to build and operate websites
Assessment criteria
The learner can: 2.1 state the purpose of markup languages and list commonly used examples 2.2 identify the roles of: a. web runtime environments b. web application programming languages c. databases in building websites and website applications 2.3 identify typical product stack combinations that can be used for web development.

Range
2.1 a range of languages should be explored 2.3 the use of mainframes and combinations of development software should be included such as SQL and ASP

Learning outcome
The learner will: 3. implement specified components of a web-site
Assessment criteria
The learner can: 3.1 state the components required to produce a web-site 3.2 design specified components of a web-site 3.3 develop specified components of a web-site 3.4 test specified components of a web-site.

Range
3.3 the design will only require a maximum of 3 pages .

Unit 209 Customer support provision 2

UAN:	**T/601/8296**
Level:	Level 2
Credit value:	9
GLH:	60
Aim:	The aim of this unit is to introduce some of the basic techniques required to network computer systems; the unit will introduce the candidate to standards and protocols.

Learning outcome
The learner will: 1. provide technical information and support in response to customer requirements
Assessment criteria
The learner can: 1.1 gather and record/log customer support requirements 1.2 provide technical support in response to customer requirements 1.3 record/log outcome of response to customer 1.4 escalate unresolved requests for technical support to suitable person(s).

Learning outcome
The learner will: 2. identify potential improvements in the customers' use of resources
Assessment criteria
The learner can: 2.1 prepare accurate records of existing hardware and software resources 2.2 gather information on customers' use of existing resources 2.3 document recommendations.

Learning outcome
The learner will: 3. assist in reviews to identify how automated procedures may improve customers' use of resources
Assessment criteria
The learner can: 3.1 identify customers'' frequently performed tasks 3.2 gather information to identify potential automated procedures 3.3 make recommendations on which procedures should be automated.

Learning outcome
The learner will: 4. create routine automated procedures and assist in the creation of complex automated procedures
Assessment criteria
The learner can: 4.1 complete routine automated procedures 4.2 select and use more complex automated procedures following an agreed pre-prepared plan 4.3 check that automated procedures perform required function 4.4 carry out testing of parts of more complex automated procedures following an agreed plan 4.5 record details of the automated procedures created.

Unit 220 Website software

UAN:	**R/502/4631**
Level:	Level 2
Credit value:	4
GLH:	30
Aim:	The aim of this unit is to introduce some of the fundamentals required for website design. Candidates will learn the tools and techniques required to make functional and professional websites.

Learning outcome
The learner will: 1. create structures and styles for websites
Assessment criteria
The learner can: 1.1 describe what website content and layout will be needed for each page 1.2 plan and create web page templates to layout 1.3 select and use website features and structures to help the user navigate round web pages within the site 1.4 create, select and use styles to keep the appearance of web pages consistent and make them easy to understand 1.5 describe how copyright and other constraints may affect the website 1.6 describe what access issues may need to be taken into account 1.7 describe what file types to use for saving content 1.8 store and retrieve files effectively, inline with local guidelines and conventions where available.

Learning outcome
The learner will: 2. use website software tools to prepare content for websites
Assessment criteria
The learner can: 2.1 prepare content for web pages so that it is ready for editing and formatting. 2.2 organise and combine information needed for web pages including across different software 2.3 select and use appropriate editing and formatting techniques to aid both clarity and navigation 2.4 select and use appropriate development techniques to link information across pages

2.5	change the file formats appropriately for content
2.6	check web pages meet needs, using IT tools and making corrections as necessary.

Learning outcome
The learner will: 3. publish websites
Assessment criteria
The learner can: 3.1 select and use appropriate testing methods to check that all elements of websites are working as planned. 3.2 identify any quality problems with websites and how to respond to them 3.3 select and use an appropriate programme to upload and publish the website 3.4 respond appropriately to problems with multiple page websites.

Unit 221 Database software

UAN:	**M/502/4555**
Level:	Level 2
Credit value:	4
GLH:	30
Aim:	The aim of this unit is to introduce candidates to the fundamentals of databases; candidates will learn to use many of the tools within database software. Candidates will also learn to construct databases that have integrity.

Learning outcome
The learner will: 1. create and modify non-relational database tables
Assessment criteria
The learner can: 1.1 identify the components of a database design 1.2 describe the field characteristics for the data required 1.3 create and modify database tables using a range of field types 1.4 describe ways to maintain data integrity 1.5 respond appropriately to problems with database tables 1.6 use database tools and techniques to ensure data integrity is maintained.

Range
1.1 candidates should identify tables, queries, forms and reports 1.6 multiple tools should be used to ensure data integrity is maintained

Learning outcome
The learner will: 2. enter, edit and organise structured information in a database
Assessment criteria
The learner can: 2.1 create forms to enter, edit and organise data in a database 2.2 select and use appropriate tools and techniques to format data entry forms 2.3 check data entry meets needs, using IT tools and making corrections as necessary 2.4 respond appropriately to data entry errors.

Learning outcome
The learner will: 3. use database software tools to run queries and produce reports
Assessment criteria
The learner can: 3.1 create and run database queries using multiple criteria to display or amend selected data 3.2 plan and produce database reports from a single table non-relational database 3.3 select and use appropriate tools and techniques to format database reports 3.4 check reports meet needs, using IT tools and making corrections as necessary.

Range
3.4 corrections should be made in response to feedback given

Unit 301 Software design fundamentals

UAN:	**L/601/3251**
Level:	Level 3
Credit value:	10
GLH:	80
Aim:	This unit covers the principles of software design and the application of the techniques used in software design to represent software solutions.

Learning outcome
The learner will: 1. understand the principles of software design
Assessment criteria
The learner can: 1.1 describe the role of software design and computer programming in the IT Systems Development Life Cycle (SDLC) 1.2 describe the application and limits of programming paradigms procedural, object orientated and event driven and the available supporting tools and environments (eg CASE tools, IDEs) 1.3 explain sequence, selection and iteration as used in computer programming 1.4 explain abstraction of data and code and the use of predefined data and code in computer programming 1.5 explain the importance of readability and understand ability of code and how these can be improved by naming, comments and layout 1.6 describe how the following factors contribute to the quality of code: efficiency, reliability, robustness, usability, portability and maintainability.

Learning outcome
The learner will: 2. apply the techniques of software design
Assessment criteria
The learner can: 2.1 develop algorithms to represent problems 2.2 identify and define data and file storage requirements including predefined data items 2.3 identify and define program structures including predefined code items. 2.4 identify and represent required inputs and outputs 2.5 use tools (e.g. pseudocode) to express software designs.

Appendix 1 Relationships to other qualifications

Links to other qualifications

Mapping is provided as guidance and suggests areas of commonality between the qualifications. It does not imply that learners completing units in one qualification have automatically covered all of the content of another.

Centres are responsible for checking the different requirements of all qualifications they are delivering and ensuring that learners meet requirements of all units/qualifications.

This qualification has connections to the:

- Level 2 Diploma in ICT Professional Competence (4520-02)
- Level 2 Award in ICT Systems and Principles (7540-02)
- Level 2 Diploma in ICT Systems and Principles (7540-02)
- Level 2 Certificate in ICT Systems Support (7540-02)
- Level 2 Diploma in ICT Systems Support (7540-02)
- Level 2 Award/Certificate/Diploma For IT Users - ITQ (7574-02)
- Level 2 Certificate For IT Users (7574-12)
-

Appendix 2 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

Centre Manual - Supporting Customer Excellence contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of learners
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents such as:

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for learners who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such on such things as:

- **Walled Garden**: how to register and certificate learners on line
- **Qualifications and Credit Framework (QCF)**: general guidance about the QCF and how qualifications will change, as well as information on the IT systems needed and FAQs
- **Events**: dates and information on the latest Centre events
- **Online assessment**: how to register for GOLA/e-volve assessments.

City & Guilds

Believe you can

www.cityandguilds.com

Useful contacts

UK learners **General qualification information**	T: +44 (0)844 543 0033 **E: learnersupport@cityandguilds.com**
International learners General qualification information	T: +44 (0)844 543 0033 F: +44 (0)20 7294 2413 E: **intcg@cityandguilds.com**
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: **centresupport@cityandguilds.com**
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) E: **singlesubjects@cityandguilds.com**
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: **intops@cityandguilds.com**
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: **walledgarden@cityandguilds.com**
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	T: +44 (0)121 503 8993 E: **business@cityandguilds.com**
Publications Logbooks, Centre documents, Forms, Free literature	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413

About City & Guilds

As the UK's leading vocational education organisation, City & Guilds is leading the talent revolution by inspiring people to unlock their potential and develop their skills. We offer over 500 qualifications across 28 industries through 8500 centres worldwide and award around two million certificates every year. City & Guilds is recognised and respected by employers across the world as a sign of quality and exceptional training.

City & Guilds Group

The City & Guilds Group operates from three major hubs: London (servicing Europe, the Caribbean and Americas), Johannesburg (servicing Africa), and Singapore (servicing Asia, Australia and New Zealand). The Group also includes the Institute of Leadership & Management (management and leadership qualifications), City & Guilds Land Based Services (land-based qualifications), the Centre for Skills Development (CSD works to improve the policy and practice of vocational education and training worldwide) and Learning Assistant (an online e-portfolio).

Published by City & Guilds, a registered charity established to promote education and training

City & Guilds
1 Giltspur Street
London EC1A 9DD
T +44 (0)844 543 0000
F +44 (0)20 7294 2413
www.cityandguilds.com

HB-12-7630