City & Guilds Level 4 Award in Security Case Development and Design Good Practice (3660-03)

April 2022 Version 2.0

Qualification Handbook

Qualification at a glance

Subject area	IT Professional
City & Guilds number	3660
Age group approved	16+
Entry requirements	Centres must ensure that any pre-requisites stated in this Handbook are met.
Assessment	Online multiple choice test
Qualification grade scale	Pass
Approvals	Approval application required. Please see **www.cityandguilds.com** for details.
Registration and certification	Registration and certification of this qualification is through the Walled Garden, and is subject to end dates.

Title and level	GLH	TQT	City & Guilds qualification number	Ofqual accreditation number
Level 4 Award in Security Case Development and Design Good Practice	46	111	3660-03	603/5329/6

Version and date	Change detail	Section
1.0 September 2019	Document created	
2.0 April 2022	Added QAN	Qualification at a glance

Contents

1   Introduction

This document tells you what you need to do to deliver the qualifications:

Area	Description
Who is the qualification for?	This qualification is designed to support learners who are on the **Technologist** pathway of the **Level 4 Cyber Security Technologist** apprenticeship, forming a mandatory qualification in that pathway.
What does the qualification cover?	The purpose of this qualification is to provide learners with the knowledge and skills required to build a security case that follows good practice in design, making use of reputable security architectures and architectural patterns. They will understand why businesses need to develop security cases and how they use them.
What opportunities for progression are there?	On achieving this qualification the learner will have completed a section of the knowledge element as part of their apprenticeship journey on the **Technologist** pathway: **Technologist pathway** • Level 4 Certificate in Cyber Security Introduction (3660-01) • Level 4 Certificate in Network and Digital Communications Theory (3660-02) • Level 4 Award in Security Case Development and Design Good Practice (3660-03) • Level 4 Award in Security Technology Building Blocks (3660-04) • Level 4 Certificate in Employment of Cryptography (3660-05)
Who did we develop the qualification with?	It was developed in collaboration with employers, sector experts and training providers using the Apprenticeship Standard and Occupational Brief as the baseline. These were created by The Tech Partnership and their Employer Groups for the specific areas. The qualification embodies the required learning for an apprentice to have the opportunity to successfully gain the relevant knowledge for their chosen career path in cyber security.

Is it part of an apprenticeship framework or initiative?	Yes – Level 4 Cyber Security Technologist (9660-12/13)

Structure

Learners must complete the single unit 403 to gain this qualification.

Total Qualification Time

Total Qualification Time (TQT) is the number of notional hours which represents an estimate of the total amount of time that could reasonably be expected for a learner to achieve and demonstrate the achievement of the level of attainment necessary for the award of a qualification.

TQT is comprised of the following two elements:
• The number of hours which an awarding organisation has assigned to a qualification for Guided Learning, and
• An estimate of the number of hours a learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place as directed by - but, unlike Guided Learning, not under the immediate guidance or supervision of - a lecturer, supervisor, tutor or other, appropriate provider of education or training

Title and level	GLH	TQT
Level 4 Award in Security Case Development and Design Good Practice	46	111

2   Centre requirements

Approval

To offer this qualification, new centres will need to gain both centre and qualification approval. Please refer to the *City & Guilds Centre Manual* for further information.

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

Resource requirements

Resources
Please see the individual unit information for any resources required.

Centre staffing

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

- be occupationally competent or technically knowledgeable in the area[s] for which they are delivering training and/or have experience of providing training. This knowledge must be to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- have credible experience of providing training

Centre staff may undertake more than one role, e.g. tutor and assessor or internal verifier, but cannot internally verify their own assessments.

Learner entry requirements

City & Guilds does not set entry requirements for this qualification. However, centres must ensure that candidates have the potential and opportunity to gain the qualification successfully and that they have the full engagement of the employer for the full programme.

Age restrictions

City & Guilds cannot accept any registrations for candidates under 16 as these qualifications are not approved for under 16s.

3 Delivering the qualification

Initial assessment and induction

An initial assessment of each candidate 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 qualifications
- any units they have already completed, or credit they have accumulated which is relevant to the qualifications
- the appropriate type and level of qualification

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

Support materials

The following resources are available for this qualification:

- Practice exam available both paper-based and on-screen.

4   Assessment

Summary of assessment methods

Candidates must:
- successfully complete one evolve test for the mandatory unit

Available assessments/assignments:

City & Guilds has written the following assessments to use with this qualification:

- Evolve tests

Assessment Types			
Unit	**Title**	**Assessment method**	**Where to obtain assessment materials**
403	Security Case Development and Design Good Practice	Multiple choice questions – online Evolve Test	Please see www.cityandguilds.com

Assessment strategy

Test specifications
The way the knowledge is covered by each test is laid out in the table below:

Assessment type: Multiple choice online test
Assessment conditions: Invigilated examination conditions
Number of questions: 20
Duration: 30 minutes
Pass mark: 14/20 (70%)
Grading: Pass/Fail

Test: 403 Security Case Development and Design Good Practice

Learning Outcome	Topic	Number of questions	Weighting
1. Describe how to build a security case	1.1 Security case requirements	9	75%
	1.2 The content of a security case	6	

2. Explain how to apply design good practice when developing a security case	2.1 The value of common security architectures and architectural patterns	4	25%
	2.2 The value of good practice in system and software development	1	
Total		**20**	

Recognition of prior learning (RPL)

Recognition of prior learning means using a person's previous experience or qualifications which have already been achieved to contribute to a new qualification.

RPL is not allowed for this qualification.

5   Administration

Quality assurance

Internal quality assurance

Registered centres must have effective quality assurance systems to ensure optimum delivery and assessment of qualifications. Quality assurance includes initial centre registration by City & Guilds and the centre's own internal procedures for monitoring quality. Centres are responsible for internal quality assurance and City & Guilds is responsible for external quality assurance.

Standards and rigorous quality assurance are maintained by the use of:
- internal quality assurance
- City & Guilds external moderation

In order to carry out the quality assurance role, Internal Quality Assurers must have appropriate teaching and vocational knowledge and expertise.

Access arrangements and special consideration

We have taken note of the provisions of equalities legislation in developing and administering this specification.

We follow the guidelines in the Joint Council for Qualifications (JCQ) document: Regulations and Guidance Relating to Candidates who are Eligible for Adjustments in Examination GCSE, GCE, GNVQ, AEA, Entry Level, Basic Skills & Key Skills Access Arrangements and Special Consideration. This is published on the JCQ website: http://www.jcq.org.uk/access_arrangements/

Access arrangements

We can make arrangements so that learners with disabilities, special educational needs and temporary injuries can access the assessment. These arrangements must be made before the examination. For example, we can produce a Braille paper for a learner with visual impairment.

Special consideration

We can give special consideration to learners who have had a temporary illness, injury or indisposition at the time of the examination. Where we do this, it is given after the examination.

Applications for either access arrangements or special consideration should be submitted to City & Guilds by the Examinations Officer at the centre.

Language of examinations

We will provide this specification in English only.

Other issues

European Dimension

City & Guilds has taken account of the 1988 Resolution of the Council of the European Community in preparing this specification and associated specimen units.

Environmental Education

City & Guilds has taken account of the 1988 Resolution of the Council of the European Community and the Report Environmental Responsibility: An Agenda for Further and Higher Education 1993 in preparing this specification and associated specimen units.

Avoidance of bias

City & Guilds has taken great care in the preparation of this specification and specimen units to avoid bias of any kind.

6 Units

Availability of units

The unit information can be found in this document.

Structure of the units

These units each have the following:
- City & Guilds reference number
- Title
- Level
- Guided learning hours (GLH)
- Learning outcomes

Centres must deliver the full breadth of the range. Specialist equipment or commodities may not be available to all centres, so centres should ensure that their delivery covers their use.

Unit 403   Security Case Development and Design Good Practice

Level:	4 Award
GLH:	46
TQT:	111

What is this unit about?

The purpose of this unit is to provide learners with the knowledge and skills required to build a security case that follows good practice in design, making use of reputable security architectures and architectural patterns. They will understand why businesses need to develop security cases and how they use them.

This unit is a mandatory unit for apprentices completing the 'Technologist' pathway of the Level 4 Cyber Security Technologist apprenticeship.

This unit is assessed through a multiple-choice test, taken online.

Learning outcomes

In this unit, learners will be able to

1. Describe how to build a security case
2. Explain how to apply design good practice when developing a security case

Learning outcome

1. Describe how to build a security case

Topics

1.1   Security case requirements
1.2   The content of a security case

Depth

Topic 1.1

The learner will be able to describe why businesses have a need for security cases and the considerations that need to be taken into account when preparing a security case:

- Need for a security case:
  - A security case is a form of assurance case which is used to structure the assurance requirements for a system
  - Sits as part of a suite of assurance cases that includes environmental, safety, reliability, and dependability
- Considerations to be taken into account when preparing a security case, such as:
  - The organisational environment in which the security case will be deployed:
    - Political
    - Economic/financial

- Social
- Technical
- Legal
- Environmental
- Threat and risk analysis:
  - Organisational priorities and requirements:
    - The critical security risks to the organisation:
      - Internal
      - External
      - Limitations, such as those suggested by PESTLE
  - Organisational risk appetite and risk tolerance:
    - Risk appetite is the amount and type of risk that an organisation is prepared to pursue, retain or take
    - Risk tolerance is a range for minimum and maximum levels of risk
- Types of controls:
  - Management controls: The security controls that focus on the management of risk and the management of information system security
  - Operational controls: The security controls that are primarily implemented and executed by people as opposed to systems.
  - Technical controls: The security controls that are primarily implemented and executed by the system through the system's hardware, software, or firmware
- Technical security controls to mitigate risks and identify attack vectors, taking into account non-technical security controls:
  - Organisational Information Security Policy:
    - Governance / Standards
    - Communication
    - Sanctions
  - Organisational Security procedures:
    - Training
    - Monitoring
  - Organisational physical access controls:
    - Mantrap
    - Cypher locks
    - Electromagnetic bolts
    - Biometrics
    - Radio Frequency Identification (RFID)
    - Security/ reception staff
    - Closed Circuit Television (CCTV)
- Definition of security issues:
  - Identified threats and vulnerabilities
  - Assess risks and impact
  - Rationale of how each risk is to be mitigated
- Technical controls that can be met with specific products and components:
  - User authentication
  - Logical access control
  - Antivirus software
  - Firewalls

- Intrusion Detection Systems (IDS)
- Intrusion Prevention Systems (IPS)
- System Hardening
- Usability considerations:
  - Performance
  - Capacity
  - Availability
  - Maintenance
  - Management overheads
  - Supportability
- Environmental considerations:
  - Usability
  - Cost
  - Size
  - Weight
  - Power
  - Heat
- Business considerations:
  - Cost
  - Warranty
  - Residual risk
  - Licensing
- Certification of products against Common Criteria for Information Technology for Security Evaluation (Common Criteria) (ISO/IEC 15408):
  - The target of evaluation (TOE)
  - Protection profile
  - Security target
  - Security functional requirements
- Conformance claims in relation to Commercial Product Assurance (CPA)
- Relevance of cryptography:
  - FIPS140-2
  - CESG Assisted Product Service (CAPS)

Topic 1.2

The learner will be able to explain the typical content of a security case, and how it utilises the considerations in Topic 1.1 to inform the development of the case:
- Summary of threats and risks
- Identification of controls, and justification for selection
- Identification of areas of conflict
- Summary of residual risks
- Alternative solutions:
  - Third-party contracts
  - Complete software solutions
- A reasoned business case:
  - Why the controls should be implemented as recommended

o The implications of not implementing recommendations and accepting the risk

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Learning outcome

2. Explain how to apply design good practice when developing a security case

Topics

2.1 The value of common security architectures and architectural patterns
2.2 The value of good practice in system and software development

Depth

Topic 2.1

The learner will be able to compare and contrast the security architecture frameworks and patterns that are typically used, such as:

- Common security architecture frameworks:
  - o Sherwood Applied Business Security Architecture (SABSA)
  - o The Open Group Architecture Framework (TOGAF)
  - o Zachman Framework
  - o National Institute of Standards and Technology (NIST) Cyber Security framework – United States Department of Commerce
  - o UK Ministry of Defence Architecture Framework (MODAF)
  - o Open Web Application Security Project (OWASP) security frameworks and patterns
- Coverage of the frameworks and pattern's components:
  - o Hardware:
    - Standby pattern has the goal to provide a fall-back component able to resume the service of the failing component
    - Replicated system pattern describes a design of redundant components, and a means of load balancing and redirection to decrease the chance of non-availability of the service
    - Error detection/correction pattern has the goal to deduce errors and possibly correct them to guarantee correct information exchange or storage
  - o Software:
    - Authentication Enforcer pattern can be used to manage and delegate authentication processes
    - Audit Interceptor pattern can be used to capture security-related events to support logging and auditing
    - Design patterns
- How security architecture patterns are structures that can be reused in different security cases:
  - o Anti-patterns
- Why only security architectural patterns and guidance from reputable sources should be used:
  - o Government bodies (NCSC)
  - o Vendors

Topic 2.2

The learner will be able to explain:

- The benefits of good development practices:
    - o Credibility
    - o Improved efficiency
    - o Standardised approach
    - o Improved quality
- The risks of not following good development practices:
    - o Accidental complexity
    - o Inadequate management of Dynamic Link Libraries (DLL)
    - o Extension conflicts
    - o Project over runs
    - o Misconfiguration of devices
    - o Overengineering

Supporting Information

Guidance for delivery

It is encouraged that, following a case study/group discussions, learners should be asked to create a simple security case based on a risk assessment of a particular set of real-world, adjusted or created scenarios. They should be able to independently work through the following:

- Identifying the technical controls
- Identifying products to meet those controls
- Selecting products on the basis of independent evaluation and certification (where available)
- Identifying security architecture and design considerations
- Identifying potential conflicts between security and other design and business requirements
- Producing a security proposal based on reasoned argument including why the controls should be implemented as recommended or alternatively the implications of not implementing the recommendations and instead making an informed decision to accept the risk

Suggested learning resources

Books

Enterprise Security Architecture: A Business-Driven Approach
Sherwood, Clark and Lynas
Published by: CMP Books 2005
ISBN: 978-1-57820-318-4

Open Enterprise Security Architecture (O-ESA) – A Framework and Template for Policy-Driven Security
Published by The Open Group 2011
ISBN: 978-90-8753-672-5

Building Secure Software – How to Avoid Security Problems the Right Way
John Viega and Gary McGraw
Published by Addison Wesley 2001
ISBN: 978-0321774958

Websites
https://www.commoncriteriaportal.org
https://www.ncsc.gov.uk
https://www.ncsc.gov.uk/scheme/commercial-product-assurance-cpa
https://www.ncsc.gov.uk/scheme/products-cesg-assisted-products-service
http://www.sabsa.org/
https://www.opengroup.org/togaf/
http://tsfdn.org/

7   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 candidates
• 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:

• 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 candidates who are eligible for adjustments in assessment.

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

• **Walled Garden**: how to register and certificate candidates on line
• **Events:** dates and information on the latest Centre events
• **Online assessment**: how to register for e-assessments.

Centre Guide – Delivering International Qualifications 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.

Specifically, the document includes sections on:
- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

Linking to this document from web pages

We regularly update the name of documents on our website, therefore in order to prevent broken links we recommend that you link to our web page that the document resides upon, rather than linking to the document itself.

8 Useful contacts

UK learners	**E: learnersupport@cityandguilds.com**
General qualification information	
International learners	
General qualification information	**E: intcg@cityandguilds.com**
Centres	
Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	**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	**E: singlesubjects@cityandguilds.com**
International awards	
Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	**E: intops@cityandguilds.com**
Walled Garden	
Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	**E: walledgarden@cityandguilds.com**
Employer	
Employer solutions including, Employer Recognition: Endorsement, Accreditation and Quality Mark, Consultancy, Mapping and Specialist Training Delivery	**E: business@cityandguilds.com**

If you have a complaint, or any suggestions for improvement about any of the services that we provide, email: **feedbackandcomplaints@cityandguilds.com**

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 is a leader in global skills development. Our purpose is to help people and organisations to develop their skills for personal and economic growth. Made up of City & Guilds, City & Guilds Kineo, The Oxford Group and ILM, we work with education providers, businesses and governments in over 100 countries.

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