

Higher National Project-based Graded Unit Specification

General Information

This graded unit has been validated as part of the HND Cyber Security. Centres are required to develop the assessment instrument in accordance with this validated specification.

Graded unit title	: Cyber Security: Graded Unit 2 (SCQF level 8)
Graded unit cod	e: J2JN 35
Type of project:	Practical assignment
Publication date:	July 2019
Source:	Scottish Qualifications Authority
Version:	02

Graded unit purpose

This graded unit is designed to provide evidence that the learner has achieved the following principal aims of the **HND Cyber Security**:

- To develop a range of specialist knowledge and skills in cyber security.
- Where applicable, to provide learners with the underpinning knowledge and skills that may allow them to sit vendor certification examinations.
- To prepare learners for progression to further studies in a related discipline at SCQF level 9.
- To prepare learners for employment in the general category of cyber security or computer support.

Credit points and level

2 Higher National Unit credits at SCQF level 8: (16 SCQF credit points at SCQF level 8)

Recommended entry to the graded unit

It is recommended that the learner should have completed or be in the process of completing the following units relating to the above principal aims prior to undertaking this graded unit:

Higher National Project-based Graded Unit Specification: General Information (cont)

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

J0J8 34	Computer Architecture
J0HJ 34	Computer Networking: Concepts, Practice and Introduction to Security
J0H9 34	Data Security
J0HK 34	Ethical Hacking
J0HH 34	Professionalism and Ethics in Cyber Security
J0HA 34	Computer Programming
J0HL 34	Digital Forensics
J27M 35	Digital Forensics
J27P 35	Server Administration for Cyber Security
J27S 34	Working in Cyber Security
J27R 35	Wireless Device Security
J11W 35	Computer Operating Systems

Core Skills

Achievement of this Unit gives automatic certification of the following:

Complete Core Skill Problem Solving at SCQF level 6

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes for this Unit specification.

Assessment support pack

The assessment support pack for this unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable instrument of assessment. Centres wishing to develop their own assessments should refer to the assessment support pack to ensure a comparable standard. Assessment support packs are available on SQA's secure website.

The Assessment Support Pack (ASP) for this unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website (http://www.sqa.org.uk/sqa/46233.2769.html).

Equality and inclusion

This graded unit has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on SQA's website: www.sqa.org.uk/assessmentarrangements

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

Assessment

This graded unit will be assessed by the use of a project-based **practical assignment**, which will be based on the development of a solution for a real client or on a scenario supplied by SQA-devised assessment exemplars or centre-devised assessments. If the method selected by a centre is a scenario given to a number of learners, then the centre must ensure the originality and uniqueness of each learner submission, through a formal authentication procedure.

The project should provide the learner with the opportunity to produce evidence that demonstrates they have met the aims of this graded unit.

The project brief/scenario will require each learner to conduct a **cyber security** related project to meet the needs of the project brief. The project brief should give guidance as to appropriate topics that will be contained within learners' evidence. The project may be based on a 'theme' with the focus on some of the topic areas covered within the HND Cyber Security. More information about this approach is available in the guidance on a theme-based approach to the assessment task design.

The project undertaken by the learner must be a complex task which involves:

- Variables which are complex or unfamiliar
- Relationships which need to be clarified
- A context which may be unfamiliar to the learner

The project must require the learner to:

- Analyse the task and decide on a course of action for undertaking the project
- Identify the requirements for the project
- Plan the solution for the project assignment
- Organise work through to project completion
- Develop the product to meet the solution
- Track and document work undertaken through to project completion
- Reflect on what has been done and draw conclusions for the future
- Produce an evaluation with critical analysis to cover the product that has been produced and an individual reflective analysis of their activities
- Produce evidence of meeting the aims which this group award graded unit has been designed to cover

It is recommended that a project brief/scenario is given out to each learner prior to starting this unit to allow time to assimilate the details and requirements of the assessment. It may be necessary for the assessor to role play in this assessment, for example as a client or supervisor. There should be clear guidance to the learner on submission dates for each of the three stages of the project and a detailed marking scheme based on the minimum evidence requirements and grade related criteria within this specification.

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

Conditions of assessment

The learner should be given a date for completion of the project. However, the instructions for the project should be distributed to allow the learner sufficient time to assimilate the details and carry out the project.

Centres must take reasonable steps to ensure that the project is the work of the learners. For example, centres may wish to informally question learners, at various stages, on their knowledge and understanding of the project on which they have embarked. Centres should ensure that where research is carried out in other establishments, or under the supervision of others, that the learner does not receive undue assistance.

If a learner is found to have plagiarised, or to have gained an unfair advantage by other means, the centre should have procedures for dealing with this, including the authority to deem that the learner has failed the assessment. Learners should provide references in the form of footnotes and/or bibliography for any materials used and/or accessed that are not their own.

Reasonable assistance

Reasonable assistance is the term used by SQA to describe the difference between providing learners with some direction to generate the evidence for assessment and providing too much support which would compromise the integrity of the assessment. Reasonable assistance is part of all learning and teaching processes. In relation to the project, assessors may provide advice, clarification and guidance during the time between the distribution of the project instructions and the completion date ie, at each stage of the project.

Remediation

Remediation allows an assessor to clarify learner responses, either by requiring a written amendment or by oral questioning, where there is a minor shortfall or omission in evidence requirements. In either case, such instances must be formally noted by the assessor, either in writing or recording and be made available to the external verifier.

Learners must be given the opportunity for remediation at each stage of the project.

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

Evidence requirements for this graded unit

The project undertaken by learners will consist of three stages: planning; developing; and evaluating. The following table specifies the minimum evidence required to pass each stage.

Project stage	Minimum evidence requirements	% mark allocation
Stage 1 — Planning	1 Planning report	40
	It is recommended that the following points are addressed in the report:	
	 Analysis of the project brief and interpretation of the brief and any additional information gathered (10 marks) 	
	 Aims and requirements of the project assignment (10 marks) 	
	 identification of the key factors influencing the project and identification of resources, materials required and how they will be accessed/obtained (10 marks) 	
	 Identification of information sources to be used and analysis of the project using appropriate techniques (10 marks) 	
	The learner must achieve all of the minimum evidence specified above in order to pass the Planning stage.	
Project stage	Minimum evidence requirements	% mark allocation
Stage 2 — Developing	 Implementation documentation — Implementing the planned solution to the task and tracking the implementation (30 marks) Test documentation — Testing the implemented solution tracking any changes and making amendments where required (10 marks) 	40
	The evidence may be recorded using appropriate techniques such as software, logbooks (electronic, manual or both), work diaries, reports, etc.	
	The learner must achieve all of the minimum evidence specified above in order to pass the Developing stage.	

Graded unit title:	Cyber Security: Graded Unit 2 ((SCQF level 8)
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Project stage	Minimum evidence requirements	% mark allocation
Stage 3 — Evaluating	 4 Evaluation report, showing the evaluation of the effectiveness of the approach/strategy taken, which includes all stages of the activity, should include all of the following: An outline of the assignment and to what extent the solution met the original requirements of the assignment brief An assessment of the strengths and weaknesses of the outputs of the practical assignment Recommendations for any future development of the solution and reasons for these recommendations A summary of any modifications to the project plan, solution design and/or implementation, that were made during the project, including reference to any unforeseen events and how they were handled Identification of any knowledge and skills which have been gained or developed while carrying out the project assignment and how the actions/process of carrying out the project could have been improved 	20
	The learner must achieve all of the minimum evidence specified above in order to pass the Evaluating stage.	

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

Assessing and grading learners

The overall project will be marked out of **100**. Only whole marks should be used.

The percentage of marks allocated to each stage of the project is outlined in the **evidence requirements**.

It is a requirement that learners must meet the minimum evidence requirements for the *Planning* stage before progressing to the *Developing* stage before progressing to the *Evaluating* stage. Learners may produce evidence over and above that specified in the minimum evidence requirements and deserve more than half the available marks for that stage. Assessors should use the grade related criteria outlined below to judge learner performance.

Learners are required to work **independently** to meet the evidence requirements of the graded unit. At the same time, learners need appropriate support. SQA uses the term reasonable assistance to describe the balance between supporting learners in their project and not providing too much assistance.

At the end of *each* stage there should be opportunities for remediation and re-assessment of learners for that particular stage. This includes the final *Evaluation* stage. Any re-assessment should be carried out in line with the centre's own assessment policy.

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

Grade related criteria		
Grade A	Grade C	
Is a seamless, coherent piece of work which:	Is a co-ordinated piece of work which:	
 has sufficient evidence for the three essential phases of the project, is produced to a high standard, and is clearly inter-related 	 has sufficient evidence of the three essential phases of the project, is produced to an adequate standard 	
 is clear and well-structured throughout and language used is of a high standard in terms of level, accuracy and technical content 	 is satisfactorily structured and language used is adequate in terms of level, accuracy and technical content 	
 effectively consolidates and integrates required knowledge and skills 	 consolidates and integrates knowledge and skills but this may lack some continuity and consistency 	
 demonstrates the learner's ability to work autonomously 	 demonstrates independent learning with minimum support and revision during project 	
 demonstrates highly developed computational thinking 	 demonstrates adequate computational thinking 	
 is the product of successful project management of all tasks associated with the project brief 	 shows a degree of project management of most tasks associated with the project brief 	
 demonstrates an accurate and insightful interpretation of the project brief 	 demonstrates an acceptable interpretation of the project brief 	
 is highly focused and relevant to the tasks associated with the project brief demonstrates highly developed 	 is focused and relevant to the tasks associated with the project brief demonstrates adequate technical skills 	
 technical skills demonstrates a high degree of self-awareness of their strengths and weaknesses. 	 demonstrates limited self-awareness of their strengths and weaknesses. 	

The above table defines the criteria for achieving Grade A and Grade C; Grade B is interpolated between these grades. The Grade Related Criteria (GRC) should be applied to the evidence requirements holistically (not atomistically). The (relevant) criteria should be applied to the evidence for each stage to derive a mark for that stage. Some criteria will apply to all stages (such as those relating to independent working and project management) and some will apply to specific stages (such as the criterion relating to interpretation of project brief, which applies to the planning stage only). Progression from stage to stage depends on the learner passing each stage (achieving a mark of at least 50%).

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

All of the grade related criteria must be included in the marking instructions. However, some criteria are more significant than others. For example, the criteria relating to technical skills are more significant than those relating to the use of language; this should be reflected in the marking instructions. The support notes provide further details and examples of how the grade related criteria can be used to grade (mark) learners' evidence. A specific approach to marking, using this design, is provided in each assessment support pack.

The marks allocated to each stage will then be aggregated to arrive at an overall mark for the project. Assessors will then assign an overall grade to the learner for this graded unit based on the following grade boundaries.

 $\begin{array}{rcl} A & = & 70\% - 100\% \\ B & = & 60\% - 69\% \\ C & = & 50\% - 59\% \end{array}$

These grade boundaries are fixed and should **not** be amended.

Re-assessment

The evidence for a project is generated over time and involves three distinct stages, each of which has to be achieved before the next is undertaken. This means that any reassessment of stages must be undertaken before proceeding to the next stage. The overall grade is derived from the total number of marks across *all* sections, and should reflect the ability of the learner to work autonomously and the amount of support required. In relation to project-based graded units, learners who have failed any stage of the project and have been unable to provide the necessary evidence through remediation must be given the opportunity for reassessment of that stage.

Any learner who has failed their graded unit or wishes to upgrade their award must be given a reassessment opportunity, or in exceptional circumstances, two reassessment opportunities. In the case of project-based graded units, this must be done using a substantially different project, ie, all stages are undertaken using a new project. In these circumstances, the highest grade achieved should be awarded.

More information on reasonable assistance, remediation and re-assessment may be found in the SQA publication *Guidance for the Implementation of Graded Units in Higher National Certification and Diplomas* (SQA, 2019, Publication code: CA7952).

Final learner grade

The final grading given must reflect the quality of the learner's evidence *at the time of the completion* of the graded unit. Learners must be awarded the highest grade achieved through any reassessment, remediation and/or reasonable assistance provided.



Higher National Project-based Graded Unit Support Notes

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

Guidance on approaches to delivery and assessment of this graded unit

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 80 hours. It is recommended that the delivery of mandatory units which are integrated within this unit are underway before this unit commences. Learning from HNC Cyber Security mandatory units may also be integrated into the delivery of this unit.

This unit is designed to assess the learner's ability to integrate knowledge and skills across a range of mandatory units within the group award of HND Cyber Security, focusing on the following objectives:

- Analyse the task and decide on a course of action for undertaking the task.
- Plan and organise work and carry it through to completion.
- Reflect on what has been done and draw conclusions for the future.

This unit should build skills and competencies which meet the criteria of SCQF level 8. It should extend the learner's ability to present and evaluate information which is routine to the subject discipline.

Preparation for the graded unit should feature in the delivery of the mandatory units noted in this specification. It is recommended that strict timelines are set for each stage of the project, with learners monitoring their time and project objectives throughout. It is recommended that each learner completes at least three interviews with the assessor during the delivery of the unit on a one to one basis. These meetings should be recorded and documentation retained along with the learner submissions.

Plagiarism

Plagiarism is a major issue for assessors in education and the assessor must ensure the authenticity of the learner evidence.

Assessors are required to ensure the authenticity of the learner's work. Regular progress meetings are one way of ensuring that the learner's work is their own. The opportunity should be taken at these meetings to use probing questions to authenticate the assessment material. Plagiarism is a potential issue with written work. Assessors must ensure that the learner is aware of their centre's plagiarism policy and ensure that submitted material is consistent with that policy. It is recommended that learners should be issued with a statement on the centre's policy on plagiarism prior to starting the assessment. Further advice about plagiarism is available from SQA.

It is important that learners receive regular feedback during the course of the project to ensure that each learner has passed each stage of the project. A learner may obtain an idea of their expected grade. When giving feedback to learners it is highly recommended that it is grading that is discussed and not individual marks.

Higher National Project-based Graded Unit Support Notes

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

Guidance on a theme-based approach to assessment

Centres should take a thematic approach to assessment by selecting one (or more) of the following themes.

- 1 Architecture and programming
- 2 Data and legislation
- 3 Digital forensics
- 4 Ethical hacking
- 5 Networking

Assessment activities may be based on one theme or a combination of themes. For example, a project may relate (only) to networking or it may involve networking, data and legislation. Some projects may involve most or all of the themes. For example, a security audit of an organisation could involve architecture, data and legislation, ethical hacking and networking.

The selected theme(s) will determine the context for the assessment activity and the nature of the resulting evidence. For example, if Theme 2 is selected, the context of assessment activity will focus on data and legislation, particularly the legal and societal aspects of cyber security, for example, laws relating to cyber security, professional and ethics, data security, social media and social engineering.

The following is an example of units that will equip learners with knowledge and skills required to complete a networking themed-based project. This example is offered as a guide only. Each centre may deliver different optional units in relation to networking based on staff skills, resources and learner groups. The group award specification for the HND Cyber Security provides more information about the above five themes.

Theme	Recommended units to be completed prior to this graded unit		
	Code	Unit title	Mandatory (M) or Optional (O)
	J0H9 34	Data Security	М
	J0HJ 34	Computer Networking: Concepts, Practice and Introduction to Security	Μ
	J0J8 34	Computer Architecture	М
	J0HH 34	Professionalism and Ethics in Cyber Security	М
	J0HL 34	Digital Forensics	М
	J0HA 34	Computer Programming	М
	J0HK 34	Ethical Hacking	М
Networking	J0J7 34	Cyber Security: Graded Unit 1	М
	J27M 35	Digital Forensics	М
	J27P 35	Server Administration for Cyber Security	М
	J27S 34	Working in Cyber Security	М
	J27R 35	Wireless Device Security	М
	J11W 35	Computer Operating Systems	М
	FR24 35	Networking Technology	0
	FR22 35	Routing Technology	0
	FR23 35	Switching Technology	0
	J0HE 34	Securing Networking Devices	0
	J0SA 34	Firewall Essentials	0

Higher National Project-based Graded Unit Support Notes (cont)

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

Guidance on grade related criteria

This guide is intended to give further detailed advice on differentiating between a Grade A and a Grade C learner.

'Has sufficient evidence for all three stages of the project produced to a high standard, and is quite clearly inter-related' (Grade A) compared with 'has sufficient evidence for all three stages of the project and is produced overall to an adequate standard' (Grade C)

This statement is about the quality and quantity of evidence produced. A Grade A learner will produced detailed evidence which is relevant and of high quality. There will be evidence of background research and analysis along with significant input at development stage in terms of design and implementation. The evidence will fully address each requirement and will be presented in a logical, clear format. A Grade C learner will provide evidence to meet the minimum evidence requirements although the quality and quantity of documentation along with the final product may show inconsistencies.

'Is clear and well-structured throughout and the language used is of a uniformly high standard in terms of level, accuracy and technical content' (Grade A) compared with 'the language used is adequate in terms of level, accuracy and technical content' (Grade C)

This statement distinguishes between a learner who consistently uses appropriate and high standard written communication within a well-structured set of evidence along with relevant technical terminology where appropriate (Grade A), compared with a learner who conveys written information adequately but has limited use of technical terminology and produces an inconsistent quality of portfolio (Grade C).

'Effectively consolidates and integrates the required knowledge and skills' (Grade A) compared with 'consolidates and integrates knowledge and skills but this may lack some continuity and consistency' (Grade C)

This statement is about the seamlessness and consistency of the final submission. A Grade A learner will evidence a high degree of knowledge and skills in all aspects of the project resulting in a polished final submission both in terms of the game and the supporting documentation. A Grade C learner will show satisfactory levels of knowledge and skills and the final submission will lack consistency in quality and content in terms of the product and/or the supporting documentation.

'Demonstrates the learner's ability to work autonomously' (Grade A) compared with 'demonstrates independent learning with minimum support and revision during project' (Grade C)

A Grade A learner will be a confident worker who can cope with all aspects of the project independently, maybe with only a 'light touch' in terms of lecturer support, whereas a Grade C learner will need some support to cope with challenges over the course of the project and may struggle to meet deadlines unless prompted.

Higher National Project-based Graded Unit Support Notes (cont)

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

'Demonstrates highly developed computational thinking' (Grade A) compared with 'demonstrates adequate computational thinking' (Grade C)

This statement distinguishes between a learner who has shown that they can undertake analyses and develop solutions effectively, independently and with an overall beneficial effect to all aspects of their work (Grade A), compared with a learner who has been less thorough in their analyses but has reached adequate though not as effective solutions to most aspects of their work.

'Is the product of successful project management of all tasks associated with the project brief' (Grade A) compared with 'shows a degree of project management of most tasks associated with the project brief' (Grade C)

This statement is about evidence of carrying out a realistic plan of activity and monitoring progress over the term of the project, modifying the plan where necessary (Grade A) compared with an approach that may be slightly more haphazard where the project plan lacks detail and causes timescale or quality issues (Grade C).

'Demonstrates highly developed technical skills' (Grade A) compared with 'demonstrates adequate technical skills' (Grade C)

This statement is about the evidence produced for each of the three stages of the project. A Grade A learner will produce detailed evidence demonstrating an in depth understanding of the technical requirements of the project whereas a Grade C learner will meet all requirements but may lack detailed evidence of their understanding of the technical requirements of the project.

'Demonstrates an accurate and insightful interpretation of the project brief' (Grade A) compared with 'demonstrates an acceptable interpretation of the project brief' (Grade C)

This statement is about the ability of the learner to analyse what is required in the given brief and demonstrate detailed knowledge and a high level of understanding in the proposed response (Grade A), compared with a learner who addresses the brief with a more basic response which lacks detail (Grade C).

'Demonstrates a high degree of self-awareness of their strengths and weaknesses' (Grade *A*) compared with 'demonstrates limited self-awareness of the strengths and weakness' (Grade C)

A Grade A learner will produce a high standard of evidence for the evaluation which will have a lot of good supporting evidence such as a good quality ongoing blog or diary throughout the assessment, an accurate updated project plan, good end user feedback, evidence of resources and online tutorials used. A Grade C learner will have adequate evidence and possibly backfill diary entries and not have kept a record of all resources use.

Higher National Project-based Graded Unit Support Notes (cont)

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

Opportunities for developing Core and other essential skills

Throughout the natural processes of preparation and production of evidence for this project, the learner will develop and demonstrate many elements of each Core Skill as follows:

Communication — Analysing the requirements of the task and presenting information and ideas both orally and in written format.

Information and Communication Technology (ICT) — Using a range of IT software in the planning and production of a solution to the task.

Problem Solving — Critical thinking and devising strategies to deal with unexpected issues or faults are fundamental elements of the project.

Learners will also develop the computational thinking skills by analysing the requirements of the project using abstraction and decomposition and programming the solution using algorithms.

This Unit has the Core Skill of Problem Solving SCQF level 6 is embedded in this unit. When a learner achieves the unit, their Core Skills profile will also be updated to include this Core Skill.

History of changes to graded unit

Version	Description of change	Date
02	Core Skill Problem Solving at SCQF level 6 embedded.	12/08/19

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General information for learners

Graded unit title: Cyber Security: Graded Unit 2 (SCQF level 8)

This is a 2-credit project-based graded unit at SCQF level 8. This unit is designed to provide you an opportunity to demonstrate that you have achieved the principal aims of the HND Cyber Security:

- To develop a range of specialist knowledge and skills in cyber security.
- Where applicable, to provide learners with the underpinning knowledge and skills that may allow them to sit vendor certification examinations.
- To prepare learners for progression to further studies in a related discipline at SCQF level 9.
- To prepare learners for employment in the general category of cyber security or computer support.

It is recommended that the learner should have completed or be in the process of completing the following units relating to the above principal aims prior to undertaking this graded unit:

J0J8 34	Computer Architecture
J0HJ 34	Computer Networking: Concepts, Practice and Introduction to Security
J0H9 34	Data Security
J0HK 34	Ethical Hacking
J0HH 34	Professionalism and Ethics in Cyber Security
J0HA 34	Computer Programming
J0HL 34	Digital Forensics
J27M 35	Digital Forensics
J27P 35	Server Administration for Cyber Security
J27S 34	Working in Cyber Security
J27R 35	Wireless Device Security
J11W 35	Computer Operating Systems

This graded unit is designed to provide evidence of your ability to plan, develop, implement and evaluate technical skills gained throughout your course. You may be required to carry out a cyber-related project with a 'theme', for example, ethical hacking or digital forensics.

The project will be marked out of 100. To pass the graded unit you must achieve 50% of the total marks and all of the minimum evidence requirements for each of the three sections. The three sections are:

- Planning: Where you will produce a plan outlining the nature of the project and the requirements to proceed. (40%)
- Developing: Where you will undertake the practical project and produce a comprehensive written report. (40%)
- Evaluating: Where you will summarise the output of the developing stage (ie, the report), and evaluate the project and the processes evolved in undertaking the project. (20%)

This Unit has the Core Skill of Problem Solving SCQF level 6 is embedded in this unit. When a learner achieves the unit, their Core Skills profile will also be updated to include this Core Skill.