



National Unit Specification: general information

UNIT Computing: Troubleshoot and Secure IT Systems (SCQF level 6)

CODE F3T4 12

SUMMARY

This Unit is designed to enable candidates to develop the skills required to resolve complex software and hardware errors, avoid compatibility issues, and configure security within a browser. Candidates must describe the legal constraints in relation to IT systems.

This Unit is suitable for candidates with an interest in the technical aspects of IT systems and builds on the skills of working within an IT environment.

OUTCOMES

- 1 Describe the effects that legal constraints have on the use of IT systems.
- 2 Resolve hardware and software faults when troubleshooting standalone and networked computers.
- 3 Configure a web browser for secure connection to the Internet for a range of different users.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following, or equivalent:

- ◆ Intermediate 2 *Computing*
- ◆ Standard Grade *Computing Studies* at Credit Level
- ◆ F1KP 11 *Computing : Install and Maintain Computer Software*
- ◆ F1KF 11 *Computing : Install and Maintain Computer Hardware*

Administrative Information

Superclass: CA

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National Unit Specification: general information (cont)

UNIT Computing: Troubleshoot and Secure IT Systems (SCQF level 6)

CREDIT VALUE

1 credit at Higher (6 SCQF credit points at SCQF level 6*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates*

CORE SKILLS

While there is no automatic certification of Core Skills in this Unit there may be opportunities for developing aspects of Core Skills.

National Unit Specification: statement of standards

UNIT Computing: Troubleshoot and Secure IT Systems (SCQF level 6)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit Specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME 1

Describe the effects that legal constraints have on the use of IT systems.

Performance Criteria

- (a) Describe the effect of copyright legislation on the use of computer software
- (b) Describe the effect of computer misuse legislation has on access to computers and data
- (c) Describe the impact of data protection legislation on the use of IT systems

OUTCOME 2

Resolve hardware and software faults when troubleshooting standalone and networked computers.

Performance Criteria

- (a) Define faults accurately using appropriate troubleshooting techniques
- (b) Resolve faults which have been identified during the troubleshooting process
- (c) Identify hardware and software incompatibility issues
- (d) Resolve the incompatibility issues identified
- (e) Document all processes accurately

OUTCOME 3

Configure a web browser for secure connection to the Internet for a range of different users.

Performance Criteria

- (a) Configure the web browser to filter content
- (b) Configure the security zones of a web browser
- (c) Configure the use of cookies by the web browser

National Unit Specification: statement of standards (cont)

UNIT Computing: Troubleshoot and Secure IT Systems (SCQF level 6)

EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that candidates meet the requirements of all Outcomes and Performance Criteria.

Written and/or oral recorded evidence and product evidence is required which demonstrates that the candidate has achieved the requirements of all of the Outcomes and Performance Criteria.

For Outcome 1 the evidence will take the form of written and/or oral recorded evidence which demonstrates that the candidate has achieved all Performance Criteria. The assessment shall be conducted under closed-book, supervised and controlled conditions and should last no more than 45 minutes. The instrument of assessment will provide opportunities for the Outcome to be fulfilled by means of sampling across the range of the content of Outcome 1. The assessment should be attempted on a single occasion. Where re-assessment is required it should contain a different sample from the range of content. Achievement can be decided by use of a cut-off score. Each sample must include:

- ◆ **four** features of current copyright legislation
- ◆ **four** features of current legislation relating to computer misuse
- ◆ **six** features of the current data protection legislation

For Outcomes 2 and 3 product evidence in the form of a candidate log is required. The log will provide a record of candidate activity during this Unit which will provide evidence that the candidate has satisfied the Performance Criteria for Outcomes 2 and 3.

The logbook must record:

- ◆ description of each fault
- ◆ troubleshooting techniques used to define fault
- ◆ steps taken to resolve each fault
- ◆ resolution of at least **four** faults related to hardware devices, of which **two** relate to a standalone computer system and **two** relate to a networked computer system
- ◆ resolution of at least **four** different faults related to software applications
- ◆ resolution of at least **two** incompatibility issues between hardware and software
- ◆ configuration of web browser content filters, security zones and cookies for each of **three** different users from: children; business; education; home shoppers

The logbook **must** be authenticated by the assessor, confirming that each task is the candidate's own work. Evidence for these Outcomes will be carried out under supervised and controlled conditions, over an extended period of time. Candidates will have access to notes and reference work as well as online help for this assessment.

National Unit Specification: support notes

UNIT Computing: Troubleshoot and Secure IT Systems (SCQF level 6)

This part of the Unit Specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

The overall aim of this Unit is to enable candidates to develop the skills required to resolve complex IT hardware and software faults. The Unit will also provide candidates with information about how to make sure hardware and software are compatible and how to deal with issues that may arise. The Unit covers the impact of current legislation relating to IT systems. The Unit will enable candidates to change Web browser configuration to meet the security requirements of different users.

This Unit is an optional Unit within the National Certificate in Digital Media Computing.

The precise content of this Unit will change over time, as computing technology develops and new devices are introduced. The content for this Unit is as follows:

Outcome 1

This Outcome relates to the knowledge and understanding of how legal constraints can affect the operation and use of IT systems.

Candidates should be aware of the purpose of Copyright legislation and how it is applied to the use of computer systems. Candidates should be familiar with the basic facts of the Copyright Designs and Patents Act, use of copyright material, what is covered under the Copyright Act, and how it is applied when using the Internet.

Candidates should be aware of the purpose of Computer Misuse legislation and how it is applied to the use of computer systems. Candidates should be familiar with the basic facts of the Computer Misuse Act, the offences covered under the Act, and actions that can be taken to deal with misuse.

Candidates should be aware of the purpose of data protection legislation and how it is applied to the use of data held on computer systems. Candidates should be familiar with the principles of the Data Protection Act, a person's rights under the Act and what course of action they should take if they believe the Act has been breached.

National Unit Specification: support notes (cont)

UNIT Computing: Troubleshoot and Secure IT Systems (SCQF level 6)

Outcome 2

This Outcome relates to practical skills in troubleshooting.

- ◆ resolving complex faults associated with hardware devices. This includes devices such as monitors, printers, storage devices and networking equipment.
- ◆ resolving faults associated with software applications, eg missing modules, insufficient memory, missing/faulty device drivers.
- ◆ resolving faults related to hardware and software incompatibility eg device drivers, processor type, processor speed, graphics performance.

Candidates should be able to resolve complex errors and problems by accessing appropriate resources to help resolve these problems. It is generally accepted that manufacturers' books and resources such as forums on the internet can form part of the troubleshooting process and may save a lot of time. Candidates should be made aware of this and how this is accepted in industry.

Troubleshooting includes defining the fault accurately using recognised techniques and a methodical approach, relevant to the individual device, ie:

- ◆ test one factor at a time
- ◆ list possible causes in order of the most likely to the least likely
- ◆ list possible solutions
- ◆ draw diagrams, if necessary

The importance of documentation when troubleshooting should be stressed to candidates. Documentation may range from eliciting initial fault report from customer, through completion of a fault report sheet to completing a summary of the fault and its solution. This is so that it may form part of a resource database of faults that may be accessed.

Outcome 3

This Outcome relates to practical skills in the context of securing a web browser. Candidates should be able to:

- ◆ configure the browser to filter out unwanted content
- ◆ configure the browser security zones
- ◆ configure the browser settings for cookies

Candidates should be able to configure the above to meet the requirements of different user groups. They should also be able to resolve common problems affecting security over the Internet by configuring the browser.

National Unit Specification: support notes (cont)

UNIT Computing: Troubleshoot and Secure IT Systems (SCQF level 6)

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Candidates will require individual access to appropriate computer hardware and software throughout this Unit. While the learning may be achieved in the context of one computer system, candidates will benefit from having some experience of an alternative operating system.

The Outcomes can be delivered in any order. The amount of time spent on each task will vary depending on the prior experience of the candidate.

Throughout this Unit, candidate activities should relate to their personal or vocational interests. For example, candidates could visit the IT department of a local business to see computer support personnel at work and learn about techniques and systems that they use, to help stimulate their interest.

This Unit may be delivered on its own or in conjunction with other units. Where delivery is alongside other units, there may be an opportunity to contextualise the content across the units in the grouping.

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

In this Unit candidates are required to carry out an investigation which may provide an opportunity to develop aspects of the *IT* Core Skill.

Also, in this Unit candidates are required to carry out an evaluation of computer systems when troubleshooting faults and incompatibility issues which may provide an opportunity to develop aspects of the *Problem Solving* Core Skill.

National Unit Specification: support notes

UNIT Computing: Troubleshoot and Secure IT Systems (SCQF level 6)

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by information and communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

It may be appropriate for some or all of the evidence for this Unit to be produced using e-assessment provided the National Standard is applied and conditions of assessment are consistent for all candidates. This may take the form of e-testing (for knowledge and understanding) and/or e-portfolios (for practical abilities).

A suitable form of assessment for Outcome 1 would be an objective test which covers all of the Performance Criteria. It is anticipated that this assessment will be carried out towards the end of the Unit once candidates have had an opportunity to acquire the essential knowledge and understanding. The assessment of Outcome 1 should last no more than 45 minutes and the questions answered under controlled, supervised closed-book conditions. It is strongly recommended that an appropriate cut-off score is used to measure achievement.

If a centre is presenting Outcome 1 of these assessments on-line the following assessment methods, where appropriate, may be selected —

- ◆ multiple choice
- ◆ drag and drop
- ◆ multiple response
- ◆ mix and match
- ◆ short response

or a combination of the above.

Centres may consider the use of alternative questions types, particularly if using Computer Assisted Assessment approaches. However, care should be taken that the questions are valid and at an appropriate level. The use of simple true/false question responses is unlikely to achieve this and should not be used.

Where re-assessment of knowledge and understanding is required the questions presented to the candidate must be different on each assessment occasion.

The Assessment Support Pack for this Unit provides sample assessment material. Centres wishing to develop their own assessments should refer to the Assessment Support Pack to ensure a comparable standard.

National Unit Specification: support notes (cont)

UNIT Computing: Troubleshoot and Secure IT Systems (SCQF level 6)

The assessment for Outcomes 2 and 3 should consist of a series of practical tasks. The tasks will involve activities carried out over an extended period of time during which the candidate is required to maintain a log. It is recommended that this assessment is started at the earliest opportunity, as soon as the candidate has acquired the necessary knowledge and skills to permit him/her to commence appropriate tasks. These tasks will normally be demonstrated by the candidate during the teaching and learning activities of the Unit, rather than as separate formal assessment activities. The candidate will be allowed access to books, notes and online help while completing the tasks.

The assessment of practical skills for Outcomes 2 and 3 may be carried out in a virtual environment. A digital repository could be used for the candidate's log, such as an e-portfolio or web log.

CANDIDATES WITH DISABILITIES AND/OR ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* (www.sqa.org.uk).