



National Unit Specification: general information

UNIT Computing: Installing and Maintaining Software (SCQF level 6)

CODE F3T1 12

SUMMARY

This Unit is designed to enable candidates to correctly install, configure and maintain system software and application software on a computer system within legal constraints. The Unit will provide candidates with information about the types and features of software, the methods and stages of software installation and the different ways in which software may be configured. Candidates will also develop the skills to select and recommend system software and application software to meet user requirements.

This Unit is aimed at candidates with previous experience of installing system and application software who wish to expand their understanding of software maintenance.

OUTCOMES

- 1 Describe the major software components of a standard computer system, their roles and typical interactions, and safe installation.
- 2 Create a plan to safely upgrade an existing computer system to a given brief.
- 3 Install, configure, test and record the upgrade to an existing computer system.
- 4 Maintain software on a given computer system to ensure it is current and secure.

Administrative Information

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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:

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

or similar qualifications or experience.

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

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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 major software components of a standard computer system, their roles and typical interactions, and safe installation.

Performance Criteria

- (a) Identify different types of system and application software and describe their roles
- (b) Describe the typical interactions between application and system software
- (c) Describe the procedures to be followed and the range of factors to be considered when installing software safely

OUTCOME 2

Create a plan to safely upgrade an existing computer system to a given brief.

Performance Criteria

- (a) Identify the system and applications software to be installed and state their source, media type and licence agreement
- (b) Produce a plan for the safe installation of the software, including the factors to be considered prior to and during the installation

OUTCOME 3

Install, configure, test and record the upgrade to an existing computer system.

Performance Criteria

- (a) Install the planned upgrade using the identified software in accordance with the plan
- (b) Configure and test the upgraded system to ensure correct functionality
- (c) Record the upgrade carried out

OUTCOME 4

Maintain software on a given computer system to ensure it is current and secure.

Performance Criteria

- (a) Locate and install virus definitions for virus scanning software on a given computer system
- (b) Perform a virus scan and record remedial actions taken
- (c) Locate and install a service pack for the operating system on a given computer system
- (d) Record the changes made to the software on this system

National Unit Specification: statement of standards (cont)

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EVIDENCE REQUIREMENTS FOR THIS UNIT

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

For **Outcome 1**, written and/or oral recorded evidence is required which demonstrates that the candidate has achieved the standard specified in the Outcome and Performance Criteria. The assessment will be under closed-book conditions and should last no more than 45 minutes. The instrument of assessment will sample across the mandatory content and must require the candidate to:

- ◆ identify two types of system software and describe their roles from: operating systems, device drivers or utility software
- ◆ identify two types of applications software and describe their roles from: business software, educational software, graphics software, communications software or media and entertainment software
- ◆ describe three interactions from: user interface, device management, memory management, multi-tasking, Application Programming Interface (API), Dynamic Linked Library (DLL)
- ◆ describe two procedures from: backup, accept legal aspects, check system resources, customise installation, copy files, install patches/upgrades, configure settings
- ◆ describe three factors from: sources for software, selection of installation type, dual boot, legal constraints, system hardware configuration

For **Outcomes 2 and 3** the candidate will be provided with a brief that requires both a system software component and an applications software component of a computer system to be upgraded. The specification for the brief must require candidates to identify the source of the software, the type of media on which it is distributed and the nature of the licence (EULA). It should require documentation to be maintained for the computer system, including the licensing agreements.

For **Outcome 2** written and/or oral recorded evidence in the form of a plan which will detail the procedures to be followed and the factors to be considered in upgrading the software on the given computer system. The plan must include details of: type of installation; check of system resources; actions required for safe recovery; monitoring installation progress; and conformance with EULA.

For **Outcome 3** written and/or oral recorded evidence and performance evidence is required that demonstrates that the candidate can carry out the upgrading of the computer system to the specified plan, and can configure and test the upgraded system and applications software. The written and/or oral recorded evidence will be in the form of an updated entry to the maintenance log for the computer system. The performance evidence will be supplemented by an assessor observation checklist of the candidate's activity which demonstrates that the candidate has achieved the standard specified in the Outcomes and Performance Criteria.

National Unit Specification: statement of standards (cont)

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For **Outcome 4** written and/or oral recorded and performance evidence is required. The candidate will be supplied with a stand-alone computer system with:

- ◆ an installed operating system and an uninstalled service pack
- ◆ installed virus scanning software and an uninstalled virus definition file

The performance evidence will be supplemented by an assessor observation checklist of the candidate's activity which demonstrates that the candidate has correctly installed the service pack for the given operating system; correctly updated the virus definitions for the given virus scanning software; successfully carried out a system scan and taken appropriate remedial actions.

The written and/or oral recorded evidence will be a record of the results of the virus scan and the remedial actions taken, and an updated entry to the maintenance log for the computer system.

The assessment will be carried out under supervised conditions. Candidates will have access to notes and reference work as well as online help for this assessment.

The Assessment Support Pack for this Unit provides sample assessment materials such as an instrument of assessment for knowledge, exemplar brief, exemplar maintenance log and virus scan report and an assessor observation checklist. Centres wishing to develop their own assessments should refer to the Assessment Support Pack to ensure a comparable standard.

National Unit Specification: support notes

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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

This Unit is an optional Unit in the National Certificate Group Award Digital Media Computing but may also be taken as a free-standing Unit. This Unit is suitable for a wide range of candidates but is particularly appropriate for those who are interested in a career in technical support and/or are undertaking the National Certificate in Digital Media Computing.

The overall aim of this Unit is to enable candidates to work safely and securely with computer software, upgrading and performing maintenance on it. The Unit aims to provide the candidates with the theoretical and practical knowledge of upgrading both system software and application software and keeping it virus free. The Unit will provide candidates with information about service packs for computer operating systems.

The aim of Outcome 1 is to familiarise the candidate with the function and role of the software components of a computer system and the interactions between system software and application software components. The Unit will enable candidates to identify the range of system software including operating systems, device drives and the wide range of utility software including those that strengthen the security of the computer system. It will also extend candidates knowledge of application software, with examples drawn from business software, educational software, graphics software, communications software and media and entertainment software.

Outcome 1 explores how application software and system software interact through shared libraries (such as DLLs), device management, memory management, multi-tasking, the user interface, and Application Programming Interfaces (APIs).

Outcome 1 introduces the range of factors to be considered prior to and during software installation, and the procedures that will help keep the installation process safe. These factors will include: the sources for software, type of installation (custom, default, unattended), legal constraints, dual boot and the system hardware configuration. Consideration of these factors will lead to the adoption of certain procedures in the installation process such as: system backup and safe recovery, check of system resources, customising the installation, copying files, accepting the legal conditions of the license and configuring settings.

Outcome 2 relates to creating a plan to safely upgrade both system and application software on an existing computer system, from a given brief. The details for the brief are given in the Evidence Requirements for this Unit. Outcome 3 is a practical task based on the identified upgrades from the brief.

National Unit Specification: support notes (cont)

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Candidates should be made aware of the possible interaction between the upgrades to be carried out and should devise a plan that will allow for safe recovery should any unplanned interaction prove incapable of resolution. The installed upgrades should be configured for the system on which they are mounted (ie take account of available disk storage, memory size, video and audio capability and connected peripherals) and then tested to ensure correct functionality. Candidates will be required to take care that they have considered the factors that will help to safely and correctly install the software upgrades. Emphasis will be placed on the need to test changes to installed software.

Outcome 4 relates to practical actions that will help maintain a computer system and its software in a good state of health. Candidates should be introduced to virus scanning software and similar products (such as spyware removal and the importance of regularly updating the virus definition files for these utility programs. They should gain experience in performing virus scans and carrying out the remedial action suggested by the software. Outcome 4 also introduces the concept of service pack updates for an operating system and candidates should recognise the need for these and their importance to safe operation of a computer system.

Outcome 4 requires candidates to locate and install virus definitions for a virus scanning package. Both the package and the install file for the virus definitions should be supplied, although candidates should know where they are to be found on the Internet. Similarly a service pack for the operating system on the given computer system should be supplied, and candidates should know where they are to be found on the Internet. Carrying out a virus scan with the updated virus definitions is also required as a practical task. Candidates will also be made aware of the importance of maintaining a record of changes made to a computer system through its maintenance log.

Assessors should ensure that candidates follow safe working practices whilst carrying out the activities.

This Unit should ideally be delivered over an extended period of time to give candidates the opportunity to install and configure a varied range of systems software and application software.

National Unit Specification: support notes (cont)

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GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

A practical hands-on approach to learning should be adopted to engage learners and exemplify key concepts. However, all practical activities should be underpinned with appropriate knowledge before candidates commence these activities.

It is recommended that candidates gain hands-on installation and configuration experience of at least one example of each type of software mentioned in these notes. While teaching will necessarily focus on a specific product, the generic features of the class of software should be emphasised.

An important aspect of this Unit is that candidates develop an appropriate technical vocabulary. Terminology and underpinning knowledge should be introduced and applied in a practical context throughout the Unit.

Throughout this Unit candidate activities, where possible, should relate to personal and vocational interests. Candidates should be encouraged to think about the ways in which they could economically upgrade their own computing systems or carry out systematic actions to maintain secure and safe working.

The use of computing magazines, relevant websites and technical reference manuals is recommended. The use of virtual machines could be used effectively for the teaching and assessment of this Unit.

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

In this Unit candidates are required to interpret a brief and create a plan to upgrade software. This is a good opportunity for developing aspects of the Core Skill in *Problem Solving*. Aspects of the Core Skill in *Communication* may also be developed when the candidate produces a plan for safe installation and then records actions taken in a standard pro forma. In addition, many opportunities may arise for candidates to work together as part of the learning process for example as they explore different system and application software. These opportunities may allow candidates to develop aspects of the Core Skill of *Working with Others*.

National Unit Specification: support notes (cont)

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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 of the evidence for this Unit to be produced using e-assessment provided the national standard is applied and the 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 assessment for Outcome 1 would be an objective test which provides an opportunity for the Outcomes to be fulfilled by means of sampling across the range of the content. Where re-assessment is required it should contain a different sample from the range of mandatory content.

There is an opportunity to use an on-line assessment environment for knowledge and understanding of Outcome 1. If a centre is presenting Outcome 1 on-line the following assessment methods, where appropriate, may be selected —

- ◆ multiple choice
- ◆ multiple response
- ◆ extended response

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.

A practical approach has been taken with respect to practical elements of Outcomes 2, 3 and 4 and it is envisaged that the Performance Criteria relating to these Outcomes will be covered by a series of tasks. The candidate will not be required to download the virus definition file or the service pack described in Outcome 4. These should be accessible directly by the candidate.

The Assessment Support Pack (ASP) for this Unit provides sample assessment material including an instrument of assessment for the knowledge, candidate briefs and assessor checklists. The pack will contain marking schemes and completed assessor observation checklists. 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)

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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).