



Higher National Unit specification: general information

Unit title: Technical Support: Supporting Users — Hardware

Unit code: H183 34

Superclass: CA

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Unit purpose

This Unit contributes to the development of entry level technical support personnel. It achieves this using a hands-on approach with holistic and realistic assessment opportunities.

On completion of the Unit the candidate should be able to:

- 1 Communicate effectively with users, and others, who have differing levels of related expertise, in a problem solving/troubleshooting environment.
- 2 Identify, install and configure computer hardware components.
- 3 Maintain and dispose of computer hardware in accordance with legislation.

Recommended prior knowledge and skills

Entry is at the discretion of the centre. It would be advantageous for candidates to have studied G9J8 45 NPA in Computer Networks and Systems at SCQF level 5, G9GK 46 NC in Digital Media Computing at SCQF level 6 or standalone Units F1KF 11 *Computing: Install and Maintain Computer Hardware*, and/or F1KR 11 *Computing: Computer Hardware and Systems* and/or F3SY 12 *Computing: Computer Hardware and Systems* prior to undertaking this Unit.

Credit points and level

1 Higher National Unit credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

**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.*

General information (cont)

Core Skills

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

There is no automatic certification of Core Skills or Core Skill components in this Unit.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Communicate effectively with users, and others, who have differing levels of related expertise, in a problem solving/troubleshooting environment.

Knowledge and/or Skills

- ◆ Communication skills
- ◆ Troubleshooting techniques

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ communicate with users to identify and demonstrate an appropriate troubleshooting technique, through a role play scenario.

or

- ◆ by rectifying an actual fault, supported by the production of suitable and appropriate documentation, paper based or electronic.

Higher National Unit specification: statement of standards (cont)

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Outcome 2

Identify, install and configure computer hardware components.

Knowledge and/or Skills

- ◆ Identify core/essential computer system components
- ◆ Install and configure computer system components

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ effectively research, identify and source equipment involved in the installing and configuring components of a computer system. This should be supported by the production of suitable and appropriate documentation, paper based or electronic.

Outcome 3

Maintain and dispose of computer hardware in accordance with legislation.

Knowledge and/or Skills

- ◆ Safety in the workspace
- ◆ Utilise maintenance tools
- ◆ Educate users in effective housekeeping
- ◆ Dispose of hardware devices

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ use and maintain a consistently safe working environment (checklist).
- ◆ utilise maintenance tools successfully (checklist).
- ◆ advise and inform users of effective housekeeping in computing (checklist).
- ◆ dispose of document devices in accordance with legislation (paper based or electronic).

Higher 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 intended to be practical in nature. The practicality of the Unit will provide opportunities for candidates to develop a range of skills required when working in the IT industry.

Outcome 1

Communication

This Outcome introduces the key soft skills required to effectively and efficiently obtain information from users. These skills are of extreme importance within the industry and it is strongly recommended that centres encourage as much interaction with persons unknown to the candidates as possible. Logistically this Outcome may prove challenging both to the centre and the candidate, however it is envisaged that this Outcome can be assessed at any suitable point in the candidate's study of this Unit through observation accompanied by an appropriate checklist, or an audio and/or video recording.

Candidates should be encouraged to enter into discussion with users in order to gain trust and confidence and not to intimidate users with their line of questioning. Candidates could initially play each role to build their confidence and skills in this particular area. Video/audio could be used for formative assessment by peers through discussion groups allowing an enriched feedback learning opportunity before completing the summative assessment. However in order to enhance confidence, real life projects are preferred when and where opportunities arise. Use of the internet to research customer service is to be encouraged to stimulate classroom discussion on the appropriate way to communicate with users via telephone and the methods to employ in face-to-face meetings.

The Unit also provides the opportunity to communicate and troubleshoot remotely. Communication can be via telephone, email or online. Evidence for assessment can be provided from these means with the possibility of screencasts of problems being resolved.

The bullet points below indicate areas of study and discussion. The list is not exhaustive and may be adjusted in line with industry and NOS requirements to maintain a relevant qualification.

Higher National Unit specification: support notes (cont)

Unit title: Technical Support: Supporting Users — Hardware

It is envisaged that ALL of the bullet points would be covered during the delivery of this Unit:

- ◆ Arrange an appropriate time to visit and be punctual
- ◆ Listen to user attentively and with respect
- ◆ Speak in plain English so that an ordinary user can follow and understand
- ◆ Avoid personal distractions
- ◆ Respect confidentiality
- ◆ update user regularly if problem requires more than one visit.
- ◆ Manage difficult users by:
 - adopting a positive attitude
 - adopting a non-judgemental/non-confrontational position
 - clarifying issues when necessary or requested

Troubleshooting

Troubleshooting techniques should be described and/or demonstrated to candidates. Candidates should also be actively encouraged to produce their own techniques for different problem scenarios. Documentation occurring from troubleshooting should be recorded for assessment purposes; this can be in the form of paper or electronic methods. It would be beneficial to candidates to gain exposure to helpdesk software and the techniques employed in using it where possible.

Candidates should be encouraged to identify and solve the user's problem first as often this does not involve repairing the system immediately. For example, an executive requires a printed document for a meeting, but the computer system will not start. The problem to immediately resolve is to provide the printed document, rather than repairing the computer.

The bullet points below indicate areas of study and discussion. Again, the list is not exhaustive and may be adjusted in line with industry and NOS requirements to maintain a relevant qualification. It is envisaged that ALL of the bullet points would be covered during the delivery of this Unit:

- ◆ Identify user problem
- ◆ Question user (who, what, when and how)
- ◆ Analyse user information obtained
- ◆ Identify a course of action
- ◆ Test solution (checklist)
- ◆ Document findings and results

Higher National Unit specification: support notes (cont)

Unit title: Technical Support: Supporting Users — Hardware

Outcome 2

This Outcome is practical in nature. It is not intended to be a memory exercise. Candidates should be able to identify common computer system components by sight or description. Candidates should also be actively encouraged to use the Internet to investigate and research devices they do not recognise. The Internet should also be used for locating device drivers, and solutions to difficult problems. Candidates should also be aware of different technologies and how they interact, such as memory types and speeds, and motherboard configuration. This Unit relates to computer systems in the broadest context such as smart phones, net books, laptops and desktop PCs.

Manufacturer and other reputable websites should be used to locate drivers, service manuals and instructions for devices/systems.

Centres are not expected to provide all equipment covered by this Outcome, but are actively encouraged to collect examples for classroom use. A possible approach is to use demonstrations and videos to provide the candidate with valuable knowledge in difficult to source technologies.

Centres are strongly encouraged to provide candidates with as much hands on experience as possible throughout this Unit, with real life cases providing the best learning experience. The bullet points below indicate areas of study, investigation and discussion. The list is not exhaustive and may be adjusted in line with industry and NOS requirements to maintain a relevant experience/expertise.

It is recommended that at least 10 from the 15 bullet points are covered during the delivery of this Unit:

- ◆ Identify core hardware devices
- ◆ Source hardware components and drivers
- ◆ ESD precautions
- ◆ POST processes
- ◆ Identify the purpose of firmware, what it contains, and how and when to change its parameters. (eg BIOS, CMOS, EUFI and GPR)
- ◆ Test and replace Power Supplies
- ◆ Replace fans
- ◆ Upgrade or replace memory
- ◆ Upgrade or replace graphics cards
- ◆ Upgrade, replace and fit a CPU
- ◆ Replace a motherboard
- ◆ Install and configure expansion cards
- ◆ Install and prepare storage devices
- ◆ Install and configure external devices
- ◆ Replace a VDU — replacing VDU Units on mobile devices

Higher National Unit specification: support notes (cont)

Unit title: Technical Support: Supporting Users — Hardware

Outcome 3

This Outcome provides candidates with the opportunity to develop their skills in creating a safe working environment, using maintenance software tools and disposing of hardware securely and safely.

Candidates should be aware of the area they work in and should be able to identify hazards and how to minimise risk to themselves and others. Electrical safety should be clearly explained and demonstrated to candidates. A clear understanding of electricity (AC/DC) and its purpose within a computing context is required. Candidates should also be made aware of chemicals or hazardous substances they may be in contact with in a computer technician role.

Candidates should be exposed to a variety of maintenance tools. These tools may be built into operating systems and/or may be third party tools. Candidates should be competent in using appropriate tools in various common problem situations.

Candidates should also be encouraged to educate users in minor maintenance issues such as:

- ◆ running regular virus checks.
- ◆ virus checking downloads.
- ◆ deleting unwanted files/applications.
- ◆ maintaining password integrity.

Candidates should be actively encouraged to dispose of broken equipment in accordance with current legislation (WEEE directive). They should be able to locate and identify disposal centres in their area and investigate the procedures for sending/transporting redundant equipment to such centres. The bullet points below indicate areas of investigation and discussion. The list is not exhaustive and may be adjusted in line with industry and NOS requirements to maintain a relevant qualification. It is envisaged that ALL of the bullet points would be covered during the delivery of this Unit:

- ◆ Maintain a safe working environment
- ◆ Electrical Safety
- ◆ Utilise appropriately, internal maintenance and diagnostic tools
- ◆ Utilise appropriately, 'third party' maintenance and diagnostic tools
- ◆ Identify disposal centres
- ◆ Securely dispose of hard drives

Higher National Unit specification: support notes (cont)

Unit title: Technical Support: Supporting Users — Hardware

Guidance on the delivery of this Unit

Outcome 1

One possible method of delivery is to start by asking candidates what constitutes customer service. Using video examples, a lively and stimulating debate can evolve within the classroom. By introducing role play activities, candidates can evaluate their own and their peers' performance within a customer centred context within the class environment. Asking candidates what they feel are the important parts within communication can lead to ownership and independence of learning, prior to summative assessment. Asking candidates/staff to bring a system problem to class is a possible solution to providing real life scenarios.

It is envisaged that teaching and formative assessment of communication and troubleshooting skills will be ongoing throughout the Unit as skills develop with experience.

Outcome 2

Research exercises are actively to be encouraged especially in relation to problems presented to the candidates. Results from these exercises should be discussed and analysed to identify probable failure modes and effective solutions.

The list of study items for this Outcome is not exhaustive. Opportunities exist to encompass a full and complete learning experience for candidates. For example, installing a network card would require configuration, to join a network. It would be unsatisfactory for a candidate to install and configure this without understanding the reasons why they are doing it. Basic networking concepts including simple IP addressing should be investigated and understood.

Candidates should be encouraged to research/investigate bullet points items not covered in formal delivery sessions.

Outcome 3

Candidates should be aware of their legal responsibilities within their working environment and to their clients, in relation to computing equipment and hazardous substances. Appropriate disposal methods should be presented and a clear understanding instilled as to why these methods should be followed. Research is encouraged to further develop knowledge and expand on classroom lectures and discussion.

Maintenance tools should be used regularly with comparisons between tools and lecturer/candidate experience(s) forming part of the delivery.

Higher National Unit specification: support notes (cont)

Unit title: Technical Support: Supporting Users — Hardware

Guidance on the assessment of this Unit

Holistic assessment is recommended for this Unit, using an approach based on a role play scenario for communication and troubleshooting, following through to an actual repair, finalised by one set of documentation (electronic or manual), including appropriate disposal of equipment. Alternatively centres may wish to create a variety of case studies for candidates to attempt.

To ensure that all Knowledge and/or Skills items have been covered, a multiple choice/response end of Unit test would be taken under closed-book, supervised conditions, covering the Knowledge and/or Skills items from Outcome 1, all of the Knowledge and/or Skills items within Outcome 2 and Outcome 3.

The number of questions for each Outcome should be as follows:

| Outcome | Number of questions |
|---------|---------------------|
| 1 | 10 |
| 2 | 20 |
| 3 | 10 |

Assessment Guidelines

A role play scenario based on an actual problem or a case study covering a relevant subset of skills from all Outcomes should be considered and developed. Each Outcome should be supported by observational checklist and/or video/audio evidence, with a paper based/electronic documentation set. The emphasis of assessment should be focussed heavily on soft skills.

An end of Unit test of 40 multiple choice/multiple response questions, attempted under closed-book, supervised conditions is also required. This test should take no more than one hour to complete. A significantly different question set should be used each time a candidate is presented.

Online and Distance Learning

The practical nature of this Unit with role play and observational assessment methods does not support distance or online learning opportunities.

Opportunities for developing Core Skills

There is no automatic Core Skill accreditation for this Unit; however it will actively encourage problem solving skills and communication skills at higher level.

Higher National Unit specification: support notes (cont)

Unit title: Technical Support: Supporting Users — Hardware

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements

History of changes to Unit

| Version | Description of change | Date |
|---------|---|------------|
| 02 | Amended wording under Outcome 2 and 3 in content and context guidance due to anomalies. | 15/10/2014 |
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General information for candidates

Unit title: Technical Support: Supporting Users — Hardware

The Unit is designed to provide you with the opportunity to develop skills that will enable you to become efficient and effective in an entry level technical support role. It achieves this by providing you with the soft skills demanded by the industry. You will gain valuable experience through peer evaluation in role play scenarios and real life customer service exposure. You will be advised in standard techniques and methods of extracting information from users and others with various levels of computing experience. You are required to analyse this information in relation to resolving the problem, identify an appropriate troubleshooting strategy and provide an effective solution which is appropriately documented.

You will investigate the requirements for safe working practices and the legal responsibilities in relation to yourself, peers and clients. You will also investigate common hazardous substances technical support personnel may be exposed to in their daily job. Electrical safety will be demonstrated and explained in a computing context to enable safe working practices. A selection of maintenance and diagnostic tools will be used for common situations encountered in computing. These tools will be discussed and analysed for best use scenarios.

A practical approach is continued to the installation and maintenance of a variety of computer systems and components. You will be expected to research and identify relevant information and techniques to carry out tasks which are unfamiliar to you. Desktop and mobile technologies will be covered through a variety of resources such as video and/or demonstration for difficult to source technologies or emerging technologies.

The Unit is intended to be practical in nature and to provide you with many opportunities to refine your entire skillset in entry level technical support roles. It is designed to build on previous learning but does not preclude direct entry at this level.

The rapid evolution of technology will be a constant challenge to technical support personnel. This Unit aims to help you gain skills to keep pace with this evolution.

To succeed in this Unit you must achieve a satisfactory level of performance in both practical and theory assessments.

On completion you will be able to:

- ◆ communicate effectively with users, and others, who have differing levels of related expertise.
- ◆ troubleshoot computer hardware problems efficiently and effectively.
- ◆ research and identify solutions, in relation to given problem scenarios.
- ◆ remove, replace, maintain and configure computer hardware safely.
- ◆ dispose of computer hardware in accordance with legislation.