National Unit Specification: general information

UNIT Computer Systems (Intermediate 2)

NUMBER DF2X 11

COURSE Computing (Intermediate 2)

SUMMARY

This Unit is designed to develop knowledge and understanding of the principles of computer systems and practical skills related to computer systems through the use of contemporary hardware and software. This knowledge, understanding and these practical skills may then be applied by the candidate to solve practical problems related to computer systems. It is designed for candidates undertaking the Intermediate 2 Computing Course, but is also suitable for anyone wishing to develop a basic understanding of computer systems and computer terminology

OUTCOMES

1. Demonstrate knowledge and understanding of a range of facts, ideas and terminology related to the principles, features and purposes of computer systems.
2. Demonstrate practical skills in the context of computer systems using contemporary hardware and software.

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 1 Computing Studies
- Standard Grade Computing Studies at General level

Administrative Information

Superclass: CD

Publication date: April 2004

Source: Scottish Qualifications Authority

Version: 1

National Unit Specification: general information (cont)

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CREDIT VALUE
1 credit at Intermediate 2 (6 SCQF credit points at SCQF level 5*).

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

National Unit Specification: statement of standards

UNIT Computer Systems (Intermediate 2)

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 the Scottish Qualifications Authority.

OUTCOME 1

Demonstrate knowledge and understanding of a range of facts, ideas and terminology related to the principles, features and purposes of computer systems.

Performance Criteria

a) Basic computing terminology is used appropriately.
b) Simple descriptions and explanations are related to practical and familiar contexts.
c) Simple conclusions, predictions and generalisations are made from knowledge and understanding.

Evidence Requirements

Written or oral evidence that the candidate can describe and explain the principles, features and purposes of computer systems accurately and concisely. Evidence should be obtained using questions in a closed book test, under supervision, lasting no more than 45 minutes. The test must sample content (see Computing (Intermediate 2) Course content) in each of the following areas:

- data representation
- computer structure
- peripherals
- networking
- computer software

(The content statements are also reproduced for convenience as a table in the support notes for this Unit).

The standard to be applied is illustrated in the National Assessment Bank items available for this Unit. If a centre wishes to design its own assessments for this Unit, they should be of a comparable standard.

National Unit Specification: statement of standards (cont)

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OUTCOME 2

Demonstrate practical skills in the context of computer systems using contemporary hardware and software.

Performance Criteria

a) A range of appropriate hardware is used effectively.
b) Common features of software are selected and used effectively.
c) Practical tasks are planned and organised with detailed guidance.
d) Practical tasks are undertaken in an appropriate range of simple contexts.

Evidence Requirements

Observation checklist showing that the candidate has demonstrated practical skills at an appropriate level in four of the following contexts:

- use of standard OS functions
- use of main functions and features of a standard application package
- use of standard file formats for text files
- accessing a LAN using a network client
- accessing the Internet for WWW and e-mail

Hard copy evidence should be provided for **one** of these activities.

These practical skills may all be demonstrated in a single extended task, or a number of smaller tasks.

The practical skills should be demonstrated in the context and at a level defined by the content statements (see Computing (Intermediate 2) Course content).

The candidate will be allowed access to books, notes and online help while completing the tasks.

(The content statements are also reproduced for convenience as a table in the support notes for this Unit).

The standard to be applied is illustrated in the National Assessment Bank items available for this Unit. If a centre wishes to design its own assessments for this Unit, they should be of a comparable standard.

National Unit Specification: support notes

UNIT Computer Systems (Intermediate 2)

This part of the Unit Specification is offered as guidance.

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 content for this Unit is detailed below (and also in the National Course Specifications: Course details.)

Content Statement: Data Representation
Representation of positive numbers in binary using examples up to and including 8 bits.
Advantages of using binary numbers.
Description of floating point representation of real numbers using the terms mantissa and exponent.
Description of file sizes, backing storage and main memory capacities using the terms: bit, byte, Kilobyte, Megabyte, Gigabyte, Terabyte (Kb,Mb,Gb,Tb).
Description of the ASCII code including control characters. Description of the term character set.
Description of bit map method of graphic representation using examples of black and white bit maps. Calculation of storage requirements.

Content Statement: Computer Structure
Description of the purpose of a processor. List the parts of a processor as ALU, control unit and registers.
Representation of the structure of a computer in the form of a simple five box diagram representing: input devices, processor, main memory, output devices, and backing storage.
Distinction between main memory and backing storage. Description of the features and uses of RAM and ROM.
Description of the uses of embedded, palmtop, laptop, desktop and mainframe computers. Comparison of features of embedded, palmtop, laptop, desktop and mainframe computers: type and speed of processor, size of main memory, backing storage, input and output devices.
Description of clock speed as a simple indicator of system performance.

National Unit Specification: support notes (cont)

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Content Statement: Peripherals
Description of the features, functions and uses of the following input devices: keyboard, mouse, microphone, touchpad, digital camera, scanner, webcam.
Comparison of input devices using appropriate characteristics including resolution, capacity, speed of data transfer, cost.
Description of the features, functions and uses of a monitor, LCD panel, inkjet and laser printers, loudspeakers.
Comparison of output devices using appropriate characteristics including resolution, capacity, speed of data transfer, cost.
Magnetic storage: description of the features, functions and uses of current magnetic storage devices and media including floppy drive, hard drive, zip drive, magnetic tape drive.
Optical storage: description of the features, functions and uses of current optical storage devices and media including CD-ROM, CD-R, CD-RW, DVD-ROM, rewritable DVD
Comparison of storage devices using appropriate characteristics including type of access, capacity, speed of data transfer, cost.
Description of the need for interfaces with reference to the following functions: compensating for differences in speed between the CPU and peripherals, data conversion from analogue to digital forms and temporary data storage.

Content Statement: Networking
Description of the following features of LANs, WANs and the Internet: transmission media, bandwidth, geographical spread and functions.
Description of the functions of a client and server on a network.
Description of the benefits of networks.
Description of the following features and functions of e-mail: e-mail address, sending, reading, replying, setting up an address book, setting up mailing lists, setting up folders. Description of the following features of the World Wide Web: web pages, hyperlinks, browser, search engines.
Description of the following economic factors which have led to the development of computer networks: ♦ falling cost of telecommunication technologies and services ♦ shared access to expensive equipment ♦ geographic spread of organisations ♦ demand for up-to-date information Description of the main features of the Computer Misuse Act, the Copyright Designs and Patents Act and the Data Protection Act.

National Unit Specification: support notes (cont)

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Content Statement: Computer Software
Distinction between an operating system and an application program with examples of each.
Explanation of the need for standard file formats. Description of the following standard file formats for text files: text, ASCII, rich text file.
Identification of data objects and operations in the context of word processing, databases, spreadsheets and graphic packages.
Definition of a virus. Description of how a virus operates. Description of the following common symptoms of virus infection: displaying unwanted messages, unusual visual/sound effects, computers rebooting unexpectedly, unwanted generation of e-mails. Description of how viruses are spread via floppy disk, homemade CDs, 'fun' websites, and e-mail attachments.
Explanation of the need for anti-virus software.

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 two Outcomes may be delivered in an integrated way rather than sequentially. For Outcome 2, the practical activities should be taught and used to illustrate and exemplify the knowledge and understanding required for Outcome 1.

The amount of time spent on each area of content will vary depending on the teaching methodology used and the ability and prior experience of the candidates. However, the following times may act as a rough guide:

data representation	6 hours
computer structure	6 hours
computer peripherals	8 hours
computer networking	6 hours
computer software	10 hours

1½ hours should be set aside to:

- administer the Outcome 1 test
- gather evidence for Outcome 2

A further 2½ hours is allowed for remediation and re-assessment if required.

If the Unit is delivered as part of a Course, the Course documentation will provide further information on teaching and learning in a Course context, including the identification of a number of 'themes' to facilitate holistic learning across the Course.

National Unit Specification: support notes (cont)

UNIT Computer Systems (Intermediate 2)

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

National Assessment Bank tests have been created specifically to assess Outcome 1 of the Unit. This assessment consists of a closed book test, and must be conducted under examination conditions. In order to gain success in this Outcome, the candidate must achieve at least the cut-off score for the test. If a centre wishes to design its own assessments for this Unit, they should be of a comparable standard

Outcome 2 requires the candidate to demonstrate practical skills while using contemporary hardware and software. These practical skills will normally be demonstrated in a number of relatively short tasks. However, they may be demonstrated in a single extended task. The 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.

To gain success in this Outcome, the candidate must demonstrate practical skills at an appropriate level in four of the following contexts, as defined in the content statements (see Computing (Intermediate 2) Course content):

- use of standard OS functions
- use of main functions and features of a standard application package
- use of standard file formats for text files
- accessing a LAN using a network client
- accessing the Internet for WWW and e-mail

Hard copy evidence should be provided for any **one** of these activities. Note that this need not be formal documentation — print outs and screen shots showing appropriate activities are adequate.

A pro-forma observation checklist for Outcome 2 is provided in the National Assessment Bank materials.

All evidence must be retained by the centre. The assessment of this Unit is subject to moderation by SQA.

SPECIAL NEEDS

This Unit Specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering special alternative Outcomes for Units. For information on these, please refer to the SQA document *Guidance on Special Assessment Arrangements* (SQA, September, 2003).