National Unit Specification: general information

UNIT   Computer Networking (Intermediate 2)

NUMBER   DF30 11

COURSE   Computing (Intermediate 2)

SUMMARY

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

OUTCOMES

1. Demonstrate knowledge and understanding of a range of facts, ideas and terminology relevant to the principles, features and purposes of networking.
2. Demonstrate practical skills in the context of networking 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 in Computing Studies at General level

Administrative Information

Superclass: CB

Publication date: April 2004

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National Unit Specification: general information (cont)

UNIT Computer Networking (Intermediate 2)

CREDIT VALUE
1 credit at Intermediate 1 (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 Networking (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 relevant to the principles, features and purposes of networking.

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 networking correctly. 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:

- network applications
- network security
- data transmission
- network protocols

(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)

UNIT   Computer Networking (Intermediate 2)

OUTCOME 2
Demonstrate practical skills in the context of networking 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 **two** of the following contexts:

- transferring files across a network using ftp
- use of encryption software to encrypt a file
- use of an e-mail application package and its various features
- creation of a web page
- implementing a personal backup strategy

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

These practical skills may all be demonstrated in a single extended task, or in 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 on-line 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 Networking (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: Network Applications
Description of services provided by the Internet; World Wide Web, electronic mail and file transfer.
Explanation of the structure of: ♦   an e-mail address   ♦   a URL (uniform resource locator)
Explanation of the purpose of a web browser.   Brief description of the functions of a web browser (access the www, provide facilities including file transfer and e-mail).
Description of a web page as a text document with hyperlinks.
Description of browsers and microbrowsers for use with wireless data (WAP).
Description of hyperlinks, search engines and navigation.
Description of a situation when an ISP (Internet service provider) is required.   Explanation of the purpose of an ISP.
Description of e-commerce: the use of the Internet in conducting business and providing a service (e-government, e-business, e-marketing and e-sales).
Description of current converging technologies in the home (home appliances with built in internal and external communication capability.)
Description of the economic implications for business and education of the growth of network technology and the Internet.
Description of main features of the Regulation of Investigatory Powers Act 2000.
Description of the need to adhere to a code of conduct governing the use, both in school and at home, of networks and the Internet.

National Unit Specification: support notes (cont)

UNIT Computer Networking (Intermediate 2)

Content Statement: Network Security
Description of security measures: ♦ physical ♦ software – password and user ID
Brief explanation of the use and advantages of encryption.
Explanation of the need for filtering Internet contents in education, home and commercial companies.
Description of potential threats to networks: ♦ hardware failure ♦ software failure ♦ data transmission failure ♦ physical disasters Description of the need for a backup strategy.

Content Statement: Data Transmission
Description of the three types of transmission: unicast, broadcast and multicast.
Description of the dual use made of networks in voice and data transmission.
Description of modern wireless communication methods: ♦ wireless personal area network (WPAN) ♦ wireless LAN ♦ wireless WAN
Description of the types of connections to the Internet (dialup modem, ADSL, cable modem, leased line and ISDN). Explanation of the term broadband.
Description of the additional hardware requirements for a wireless LAN (receiver, transmitter and wireless NIC).

Content Statement: Network Protocols
Description of name services (name resolution); DNS (domain names, host name resolution).

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 alternative operating systems.

The two Outcomes should 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.

National Unit Specification: support notes (cont)

UNIT   Computer Networking (Intermediate 2)

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 are suggested as a rough guide:

network applications	12 hours
network security	10 hours
data transmission	11 hours
network protocols	3 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 Networking (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 as a single task or a number of relatively small tasks undertaken 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 task(s).

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

♦   transferring files across a network using ftp
♦   use of encryption software to encrypt a file
♦   use of an e-mail application package and its various features
♦   creation of a web page
♦   implementing a personal backup strategy

Hard copy evidence should be provided for **one** of these activities. Note that this evidence need not be formal reports; it could consist of a printout or a screen shot from any of the practical activities.

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).