

Higher National Unit Specification

General information for centres

Unit title: Internet: Introduction to Technologies

Unit code: DF62 33

Unit purpose: This Unit is designed to enable candidates to gain an understanding of Internet Technologies. Candidates will learn how to use the services provided by the Internet such as e-mail and the World Wide Web (WWW). Candidates will also learn how to create basic web pages, technical aspects of the Internet, how it works and the languages used by the Internet. Candidates will also learn about the hardware and software used by the Internet and of current Internet technologies.

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

1. Describe the development of the Internet and the World Wide Web.
2. Describe the structure, operation and terminology of the Internet.
3. Describe current Internet technologies.
4. Use a range of Internet services.
5. Create basic web pages.

Credit value: 1 HN Credit at SCQF level 6: (8 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.*

Recommended prior knowledge and skills: Access to this Unit will be at the discretion of the Centre. However, it is essential that the candidate have prior experience of using a computer system. This may be evidenced by the possession of relevant National Units, HN units or practical experience.

Core skills: There may be opportunities to gather evidence towards core skills in this Unit, although there is no automatic certification of core skills or core skills components.

Context for delivery: This Unit is included in the framework of a number of HNC and HND group awards. It is recommended that it should be taught and assessed within the context of the particular group award to which it contributes.

General information for centres (cont)

Assessment: There are five Outcomes within this Unit, the first 3 of which are theory and the last 2 which are practical. The first 3 Outcomes require candidates to produce answers to 20 short or restricted response questions testing underpinning knowledge. Candidates are required to obtain 12 correct answers out of 20 (60%) in each outcome in order to achieve a pass on Outcomes 1, 2 and 3.

The fourth and fifth Outcomes are practical in nature and should provide the candidate with the basic skills necessary to use the services of the Internet and to create web pages. Assessment evidence for Outcomes 4 and 5 will be in the form of assessor checklists and hard copies of the appropriate information. Practical assessment must therefore be carried out in supervised conditions.

Higher National Unit specification: statement of standards

Unit title: Internet: Introduction to Technologies

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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

Describe the development of the Internet and the World Wide Web.

Knowledge and/or skills

- ◆ Key elements of the development of the Internet and the World Wide Web
- ◆ Internet protocols and their functions
- ◆ The description of a mark up language
- ◆ The functions of a mark up language
- ◆ Key terminology used for the Internet and the World Wide Web.

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by producing answers to a set of 20 short or restricted response questions in which they can describe:

- ◆ Key elements of the development of the Internet and the World Wide Web.
- ◆ Internet protocols and their functions.
- ◆ An appropriate mark up language.
- ◆ The functions of a mark up language.
- ◆ Key terminology used for the Internet and the World Wide Web.

Each of the knowledge and/or skills must be covered in the assessment and the questions allocated on an equal basis. The assessment will be closed book and is to be completed under supervised conditions within 1 hour. Candidates must obtain 12 out of 20 (60%) correct answers in order to obtain a pass in this outcome.

Assessment guidelines

Candidates may not bring to the assessment event any notes, textbooks, handouts or other material.

Higher National Unit specification: statement of standards (cont)

Unit title: Internet: Introduction to Technologies

Outcome 2

Describe the structure, operation and terminology of the Internet.

Knowledge and/or skills

- ◆ Structure of the Internet.
- ◆ Software and hardware elements needed for connecting to the Internet.
- ◆ Main services provided by the Internet
- ◆ Types of search engines and their operation

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by producing answers to a set of 20 short or restricted response questions in which they can describe:

- ◆ All elements of hardware and software, which are required to connect a PC to the Internet
- ◆ An outline of the principal features of Internet architecture, including network, servers and Internet Service Providers (ISPs)
- ◆ At least 3 of the main services provided by the Internet
- ◆ At least 2 types of search engines and their operation.

Each of the knowledge and/or skills must be covered in the assessment and the questions allocated on an equal basis. The assessment will be closed book and is to be completed under supervised conditions within 1 hour. Candidates must obtain 12 out of 20 (60%) correct answers in order to obtain a pass in this outcome.

Assessment guidelines

Candidates may not bring to the assessment event any notes, textbooks, handouts or other material.

Higher National Unit specification: statement of standards (cont)

Unit title: Internet: Introduction to Technologies

Outcome 3

Describe current Internet technologies.

Knowledge and/or skills

- ◆ How bandwidth can affect multimedia on the Internet.
- ◆ Methods of data compression for the Internet.
- ◆ Standards and file formats used on the Internet.

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by producing answers to a set of 20 short or restricted response questions in which they can describe:

- ◆ How bandwidth can affect multimedia on the Internet
- ◆ At least 3 methods of data compression for the Internet.
- ◆ At least 3 standards used on the Internet.
- ◆ At least 3 file formats used on the Internet.

Each of the knowledge and/or skills must be covered in the assessment and the questions allocated on an equal basis. The assessment will be closed book and is to be completed under supervised conditions within 1 hour. Candidates must obtain 12 out of 20 (60%) correct answers in order to obtain a pass in this outcome.

Assessment guidelines

Candidates may not bring to the assessment event any notes, textbooks, handouts or other material. Where appropriate, candidates should be encouraged to carry out research for extended information on current and future technologies of the Internet.

Higher National Unit specification: statement of standards (cont)

Unit title: Internet: Introduction to Technologies

Outcome 4

Use a range of Internet services.

Knowledge and/or skills

- ◆ Use an email package to send and retrieve messages.
- ◆ Send and retrieve email attachments.
- ◆ Use the World Wide Web to access information.
- ◆ Use search engines effectively to locate and access web sites.
- ◆ Use communities/newsgroups to post/answer messages.

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can:

- ◆ Send and receive a minimum of 2 e-mail messages on topics relating to the candidate's subject area.
- ◆ Send and receive a minimum of 2 file attachments.
- ◆ Access a minimum of 2 web sites via the World Wide Web relating to the candidate's subject area. One of the web sites is to be accessed using a URL and the other using a search engine.
- ◆ Post and answer 2 messages using a community related to the candidate's subject area.

Evidence will be in the form of an observation checklist and hard copies of work carried out for emails and attachments sent and received. Information to be accessed via the World Wide Web must be relevant to the candidates' subject area.

Assessment must be carried out in supervised conditions sufficient to ensure confidence in the authenticity of each candidates work. Hard copies of this evidence and the assessor's observation checklist should be produced and included in the candidate's portfolio of evidence.

Assessment guidelines

Evidence for Outcome 4 may be generated throughout the delivery of the Unit, provided that it is carried out under supervised conditions.

Higher National Unit specification: statement of standards (cont)

Unit title: Internet: Introduction to Technologies

Outcome 5

Create basic web pages.

Knowledge and/or skills

- ◆ Create web pages using an appropriate mark up language
- ◆ Create web pages using a web editor.

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can produce for two different given topics:

- ◆ Using an appropriate mark up language web page generator
 - A minimum of two pages, including at least one external hyperlink and one internal hyperlink.
- ◆ Using an appropriate web editor
 - A minimum of two pages, including at least one external hyperlink and one internal hyperlink.

Evidence to satisfy this outcome will take the form of:

- ◆ Hard copies of the appropriate mark up language code produced by:
 - The web page generator
 - The text editor.
- ◆ Screen dumps of the web pages produced by:
 - The web page generator
 - The text editor.

This assessment must be carried out within a short timeframe, i.e. no more than 2 hours for each of the two different given topics. Assessment must be carried out in supervised conditions sufficient to ensure confidence in the authenticity of each candidate's work. Hard copies of this evidence and the assessor's observation checklist must be produced and included in the candidate's portfolio of evidence.

Assessment guidelines

Candidates should be given a list of topics to choose from to develop their web pages. A different topic should be selected for each method of production of the web pages.

Administrative Information

Unit code: DF62 33

Unit title: Internet: Introduction to Technologies

Superclass category: CE

Date of publication: December 2003

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History of Changes:

Version	Description of change	Date
2	Statement added to 'Support Notes' to identify Outcome(s) that can be assessed using the SQA electronic assessment system.	15/05/06

Source: SQA

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Higher National Unit specification: support notes

Unit title: Internet: Introduction to Technologies

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. This could be allocated as indicated in the table below.

Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
8 hours	8 hours	8 hours	4 hours	12 hours

The use of notional design length for programme design and scheduling is advisory only. In centres where less than the notional design length is allocated, it is recommended that time is deducted from that allocated to assessment rather than from the teaching/learning allocation.

Guidance on the content and context for this Unit

This unit provides an overview of how the Internet functions. It is important that candidates are made aware of how the Internet functions in order to use the Internet to its fullest potential now and at a later stage. The candidates should also gain basic skills of creating web pages using an appropriate mark up language, probably HTML and web editors.

Outcome 1 deals with the key elements of the development of the Internet and the World Wide Web. Candidates should be encouraged to conduct their own research into the history and development of the Internet and WWW by using its own features and functions to discover the relevant information. At the time of writing examples of key elements and protocols include:

- ◆ Key elements could be TCP/IP, packet switching, ISP, URL, Plug-ins, firewalls
- ◆ Protocols could be TCP/IP and DNS, FTP, HTTP, HTTPS, SMTP and POP, NNTP, PPP, SliP.

In describing the features of a mark up language candidates should be introduced to for example, HTML tags such as titles, headings (H1, H2, etc) body settings such as background, fonts, colours, size, line breaks, paragraph breaks, rules, hyperlinks, tables, graphics and text.

Relevant terminology for the Internet and the World Wide Web should be used throughout the Unit. It is recommended that candidates build up their own 'Glossary of Terms' which would include relevant descriptions and meanings.

It may be appropriate to delay the assessment for Outcome 1 until well into the delivery of Outcome 5 which introduces candidates to the practical aspects of the use of mark up language code.

Higher National Unit specification: support notes (cont)

Unit title: Internet: Introduction to Technologies

Outcome 2 introduces candidates to the structure of the Internet, the software and hardware elements needed for connecting to the Internet, the main services provided by the Internet and the types of search engines and their operation. The structure of the Internet should include, for example:

- ◆ Linear
- ◆ Hierarchical
- ◆ Web or Mesh

Software and hardware elements needed for connection to the internet should include, for example:

- ◆ Data connecting equipment (modem) and data terminating equipment (computer), connectors and cables
- ◆ Analogue telephone lines, digital telephone lines (ISDN), leased lines, and routers.
- ◆ The operating system
- ◆ Web server software
- ◆ Protocols (in relation to 'connection')
- ◆ Internet naming (e.g. DNS) and addressing systems
- ◆ Security (e.g. firewalls, gateways)
- ◆ Proxy servers

The range of Internet Services should cover, for example:

- ◆ Email
- ◆ WWW (World Wide Web)
- ◆ IRC (Internet Relay Chat), conferencing
- ◆ Newsgroups, Newsnet, bulletin boards
- ◆ File transfer
- ◆ Telnet

The types of search engine should cover, for example:

- ◆ FTP
- ◆ Free
- ◆ MP3
- ◆ Meta
- ◆ Internet

It may be appropriate to delay assessment of Outcome 2 until well into the delivery of Outcome 4 which introduces candidates to the practical aspects of Internet service provision.

Higher National Unit specification: support notes (cont)

Unit title: Internet: Introduction to Technologies

Outcome 3 introduces candidates to how bandwidth can affect multimedia on the Internet, methods of data compression for the Internet and the standards and file formats used on the Internet. Candidates should gain sufficient knowledge to determine how multimedia publications, files and web pages may be affected by bandwidth. Candidates should learn about for example:

- ◆ Definition of bandwidth
- ◆ Analogue and digital bandwidth,
- ◆ Base band and broadband,
- ◆ Bandwidth measurement (Hertz)
- ◆ Throughput dependencies on Internetworking devices, e.g.
 - Types of data being transferred
 - Network topology
 - Network infrastructure
 - Number of users on the network
 - User computer
 - Server computer
 - Power conditions
 - BIT speeds
- ◆ Sending and receiving large data files and the effect on transmission time and costs
- ◆ Data compression techniques (not in great depth as this is covered in other units) and how to compress a data file. (This latter could be carried out as part of Outcome 4 activities)
- ◆ The various file formats used on the Internet, especially in relation to multimedia publications. (This need not be covered in great depth either as this topic is covered in other units)

Outcome 4 introduces candidates to using an email package to send and retrieve messages and attachments. Candidates should also learn how to use the World Wide Web to access information and to use search engines effectively to locate and access web sites. Candidates should learn how to use communities and newsgroups to post and answer messages. Web sites to be accessed should be related to candidates chosen subject area and candidates should be encouraged to use the Internet as a method of research for information on current and future technologies required for Outcome 3. Candidates should learn how to access the Internet, for example, to: locate and access search engines; apply suitable search techniques and search criteria; access given websites; save and store frequently-used website addresses; locate and download information; send, receive and reply to email messages; send and receive attachments; maintain an email address book; handle distribution lists; file email appropriately; virus check email and email attachments as appropriate.

Higher National Unit specification: support notes (cont)

Unit title: Internet: Introduction to Technologies

The aim of **Outcome 5** is to provide candidates with some basic skills in using an appropriate mark up language, probably HTML, and a web page editor. This should enable candidates to experience the differences between using a text processor to code for web pages and using a web page generator that produces the mark up language for them. It is recommended that the candidate be shown how to design and build basic web pages using for example:

- ◆ Text, graphics and numbers
- ◆ Tables, forms, interactive features, for example, full text search, table of contents
- ◆ Hyperlinks (text and graphic) within a web page, to another page at some web site, to an external WWW site, to email, to an FTP server document
- ◆ HTML tags, e.g. headings (H1, H2, etc), body settings such as background, foreground, fonts, colours, size etc
- ◆ Line breaks, paragraph breaks, rules etc.

Guidance on the delivery and assessment of this Unit

It is recommended that Outcome 4 is delivered close to the start of the unit and continues throughout the length of the unit. Communication between candidate and tutor could be done via email, therefore covering this part of Outcome 4. Communities could be used instead of newsgroups. This would need to be set up at the beginning of the course and used by candidates throughout the Unit to post messages. It may be more appropriate to deliver Outcome 3 towards the end of the Unit by which time candidates should have gained much more insight into the application of the knowledge and/or skills required for this Outcome.

Outcome 1

The first Outcome requires candidates to produce answers to 20 short or restricted response questions that test underpinning knowledge. The assessment instruments for Outcome 1 should be updated taking into consideration future technology when required.

Candidates are required to obtain 12 correct answers out of 20 (60%) in order to achieve a pass in Outcome 1.

Outcome 2

The second Outcome requires candidates to produce answers to 20 short or restricted response questions that test underpinning knowledge. The assessment instruments for Outcome 2 should be updated taking into consideration future technology when required.

Candidates are required to obtain 12 correct answers out of 20 (60%) in order to achieve a pass in Outcome 1.

Higher National Unit specification: support notes (cont)

Unit title: Internet: Introduction to Technologies

Outcome 3

The third Outcome requires candidates to produce answers to 20 short or restricted response questions that test underpinning knowledge. The assessment instruments for Outcome 3 should be updated taking into consideration future technology when required. This outcome is described in the statement of standards and should require candidates to carry out some research of their own. The current technologies of the Internet at the time of writing may not be current when the unit is delivered. However, it is recommended that the candidates be given the most up-to-date information.

Candidates are required to obtain 12 correct answers out of 20 (60%) in order to achieve a pass in Outcome 1.

Outcome 4

It is recommended that a portfolio of hard evidence should be started at the beginning of the unit with the candidate adding each hard copy of evidence as and when completed. Hard copies of this evidence and the assessor's observation checklist should be produced and included in the candidate's portfolio of evidence. Evidence for Outcome 4 may be generated throughout the delivery of the Unit, provided that it is carried out under supervised conditions. Practical assessment should be carried out in supervised conditions.

Outcome 5

Evidence to satisfy this outcome will take the form of hard copies of mark up code of web pages produced by use of a web page generator and hard copies of code for web pages produced by using a web editor. Screen dumps for both types of web pages should also be included in a portfolio of evidence. It is recommended that this assessment be carried out within a short timeframe, i.e. 2 hours or 1 class session for each. A minimum of two web pages, including at least one external hyperlink and one internal hyperlink must be produced. Using a different topic, another two web pages should be created using a web page editor such as Microsoft FrontPage. The web pages should include titles, headings, font face, sizes, colours, backgrounds, graphics, tables, horizontal rules, images, text and hyperlinks (external and internal). Practical assessment should be carried out in supervised conditions.

If a centre is delivering this unit they can deliver the number of questions identified for each outcome listed in each column by using the SQA electronic assessment system.

Unit No	Unit Name	O1	O2	O3	O4	O5
DF62 33	Internet: Introduction to Technologies	20	20	20		

* The shaded outcomes column will be assessed in line with the method in the unit specification as previously published

Higher National Unit specification: support notes (cont)

Unit title: Internet: Introduction to Technologies

Some of the evidence requirements may be produced using e-assessment. If you wish to use e-assessment using the SQA online assessment system for this purpose, there is no requirement for you to seek prior approval so long as the normal standards for validity and reliability are observed.

Please see the following SQA publications for further information on e-assessment:

- (1) 'SQA Guidelines on Online Assessment for Further Education' (March 2003)
- (2) 'Assessment & Quality Assurance in Open & Distance Learning' (Feb 2001).

If a centre is presenting this Unit involving the use of short answer or restricted response question types, these may be delivered within the SQA on-line assessment system using the following assessment methods, where appropriate:

- ◆ Multiple choice
- ◆ Drag and drop
- ◆ Multiple response
- ◆ Mix and match
- ◆ Gap fill
- ◆ Re-order
- ◆ Hot spots

The complete assessment could be made up of any combination of the above. It is expected that the questions will be one of the available types defined in the SQA on-line assessment system.

Assessment must be undertaken in supervised conditions and is closed book. A candidate should complete this assessment within one hour. Candidates may not bring to the assessment event any notes, textbooks, handouts or other material. Candidates must answer at 60% of the questions correctly.

Higher National Unit specification: support notes (cont)

Unit title: Internet: Introduction to Technologies

Open learning

If this Unit is delivered by open or distance learning methods, additional planning and resources may be required for candidate support, assessment and quality assurance.

A combination of new and traditional authentication tools may have to be devised for assessment and re-assessment purposes. For further information and advice, please see *Assessment and Quality Assurance for Open and Distance Learning* (SQA, February 2001 — publication code A1030).

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, 2001).

General information for candidates

Unit title: Internet: Introduction to Technologies

This Unit is designed to enable you to use some of the services provided by the Internet and to learn about the various technical aspects of the Internet. You should also gain the skills to create basic web pages using both a text editor and web page generator where you should experience the differences between creating pages by coding with an appropriate mark up language and having mark up language code generated for you.

On completion of the Unit you should be able to:

- ◆ Understand the hardware and software requirements for accessing the Internet.
- ◆ Know about the current technologies of the Internet.
- ◆ Have a basic understanding of Internet protocols.
- ◆ Know about the key factors influencing the Internet.
- ◆ Know about the file formats and standards used by the Internet.
- ◆ Know about methods of file compression and how to compress large data files.
- ◆ Use the Internet to send and receive email.
- ◆ Use email to send and receive files.
- ◆ Use the Internet to carry out research.
- ◆ Create basic web pages.

Outcome 1, 2 and 3 are based on theory and underpinning knowledge of the Internet. These three outcomes will each be assessed using 20 short response questions. The assessments will be conducted in a supervised environment under closed-book conditions. This means that you will not be allowed to have any study material with you during the assessment period. Each assessment will last for 1 hour. In order to achieve a pass in Outcomes 1, 2 and 3, you will need to answer 12 out of the 20 questions correctly (i.e. gain 60%) on each of the three assessments.

Outcomes 4 and 5 are practical in nature, although both contain some elements of required knowledge that will be presented to you. You must demonstrate a satisfactory level of performance in a number of practical tasks that cover these two Outcomes. Evidence of each completed task will be submitted to your tutor and stored in a portfolio. All practical assignments will be carried out under supervised conditions.