National Unit Specification: general information

UNIT The Internet (Higher)

NUMBER DM4F 12

COURSE Information Systems (Higher)

SUMMARY

This Unit is designed to develop knowledge and understanding of the operating principles of the Internet, Internet services and web site design and provides an opportunity to apply this knowledge to solve practical problems through the use of contemporary hardware and software. It is designed as an option for candidates undertaking the Higher Information Systems Course but is also suitable for anyone wishing to extend and deepen their understanding of the Internet beyond Intermediate 2 level or those who have practical experience of using the Internet wishing to develop a secure understanding of the underlying technology.

OUTCOMES

1. Demonstrate knowledge and understanding of the Internet with regard to operating principles, services, resources and web site construction.
2. Demonstrate practical skills using contemporary hardware and software in the context of Internet web site construction.

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 2 The Internet Unit
- Intermediate 2 Information Systems
- Intermediate 2 Computing
- Standard Grade Computing Studies at Credit level

Administrative Information

Superclass: CB

Publication date: August 2005

Source: Scottish Qualifications Authority

Version: 01

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CREDIT VALUE

1 credit at Higher (6 SCQF 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

Information on the automatic certification of any Core Skills in this Unit is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, publication code BA0906).

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 the Scottish Qualifications Authority.

OUTCOME 1
Demonstrate knowledge and understanding of the Internet with regard to operating principles, services, resources and web site construction.

Performance Criteria
a) Terminology is used appropriately.
b) Technically accurate descriptions and explanations are related to practical and familiar contexts.
c) Conclusions, predictions and generalisations are made from knowledge and understanding.

Evidence Requirements
Written or oral evidence that the candidate can describe and explain the operating principles, services, and resources of the Internet and appropriate aspects of Internet web site construction 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 the content (see Information Systems (Higher) Course Content) in each of the following areas:

- Internet fundamentals
- services and resources provided by the Internet
- Internet developments
- construction of Internet web site

(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.

OUTCOME 2
Demonstrate practical skills using contemporary hardware and software in the context of Internet web site construction.

Performance Criteria
a) A range of appropriate features of hardware is used effectively and efficiently.
b) An appropriate range of features of software is used effectively and efficiently.
c) Practical tasks are planned and organised with minimal guidance.
d) Practical tasks are undertaken in an appropriate range of familiar contexts.

National Unit Specification: statement of standards (cont)

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

- use of HTML coding (including layout tables) in web page design
- use of client side scripting in web page design
- use of a cascading style sheet in web site design
- creation of web pages forming multi-page web site with links to other pages on same site

Hard copy evidence should be provided demonstrating two of these skills.

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

The practical skills should be demonstrated in the context defined in the content statements (see Information Systems (Higher) Course Content).

The candidate will be allowed access to books, notes and on-line help while completing the task(s).

(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 The Internet (Higher)

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 statements in the left-hand column describe the content covered in the corresponding Unit at Intermediate level, and are included here to clarify the context for the new learning for this Unit. They indicate the prior learning expected of the candidate before undertaking new learning within this Unit. Content in the right-hand column is the new content for this Unit.

Content Statements: Internet Fundamentals	
Intermediate 2	Higher
Description and explanation of the following concepts in relation to Internet operation and usage: ♦ *Internet hosting* ♦ *packets* ♦ *TCP/IP* ♦ *IP Addresses* ♦ *routing* ♦ *bandwith* ♦ *hardware components (router, switch, multiplexer)* ♦ *physical structure and topology of the Internet*	Explanations of the following technical concepts in relation to Internet operation and usage: ♦ packet switching ♦ the role of routers and routing tables in forwarding data packets ♦ Uniform Resource Locator structure (protocol, domain name, path, file identifier, additional parameter/port) ♦ IP address structure and classification (class A, B, C) ♦ gateway address ♦ sub-net mask
Description of the need for protocols. *Description of the purpose of the following protocols:* ♦ *http* ♦ *FTP* ♦ *POP/SMTP*	Description of the purpose and the use of the following Internet protocols: ♦ TCP/IP (Transmission Control Protocol/Internet Protocol) ♦ DNS (Domain Name Server) Protocol ♦ TELNET terminal emulation protocol Explanation of the reasons for the continued revision of some protocols.
	Description of the function of the following organisations: ♦ The Internet Engineering Task Force (IETF) ♦ Internet Assigned Numbers Authority (IANA) ♦ The World Wide Web Consortium (W3C) ♦ Domain name registrars (including Nominet in the UK)

National Unit Specification: support notes (cont)

UNIT The Internet (Higher)

Intermediate 2	Higher
Description and explanation of the social, ethical and legal implications of the internet including effects on: family, employment and information rich and poor. *Explanation of issues related to censorship and privacy.*	Description of the main features and purposes of current national and policing policies relating to the Internet: ♦ Data Protection Act (web servers and guest books) ♦ Computer Misuse Act (viruses, hacking, file copying) ♦ need for international agreements ♦ need for international policing of the Internet

Content Statements: Services and resources provided by the Internet	
Intermediate 2	Higher
Description of the main features of the following Internet services and resources, or contemporary replacements. ♦ *World Wide Web (WWW)* ♦ *email (web and client based)* ♦ *conferencing and newsgroups* ♦ *file transfer and file updating* ♦ *chat/instant messaging* *Exemplification of uses of these services in business, educational and personal contexts.*	Description of features and uses of a range of Internet resources including academic, commercial and personal web pages. Assessment of web resource information for accuracy, bias and credibility.
Description and effective use of internet browser (including navigation, search and save facilities).	Description of the capabilities of browsers (including HTML interpretation, client side scripting, cookie functions and built in encryption functions).
Description and effective use of search engines, including Boolean searching. *Description of main features and uses of a range of Internet advanced search services.* *Explanation of the need for and use of virus protection, including the need for regular updating of virus protection software.*	Description of the security and privacy issues relating to: ♦ encryption ♦ key distribution ♦ PGP and RSA ♦ public and private keys ♦ secure sockets ♦ proxy servers ♦ firewalls ♦ site usage tracking

National Unit Specification: support notes (cont)

UNIT The Internet (Higher)

Content Statements: Internet developments	
Intermediate 2	Higher
Description of current trends in Internet development with regard to the influence of the following on system performance: ♦ *communications hardware* ♦ *browsing software* ♦ *security software*	Description of contemporary technical developments related to Internet usage and operation including: ♦ web based databases ♦ dynamic page design

Content Statements: Construction of Internet web page	
Description of the main features of web authoring packages: ♦ *icon based* ♦ *web tools* ♦ *scripting tools* ♦ *hyperlinks* ♦ *file structure*	Description of the use of web authoring packages in web page design (including page layout design and uploading of pages). Comparison of the use of web authoring packages and direct HTML coding.
Description and exemplification of: ♦ *absolute page addressing* ♦ *relative page addressing* ♦ *picture compression* *Explanation of:* ♦ *problems associated with absolute addressing* ♦ *the need for picture compression*	Description and exemplification of HTML coding skills including the attributes of the following common tags: ♦ <meta> ♦ the NAME and HREF (including mailto) attributes of the<A>element ♦ <head>, <body>, , <title>, <table>, <tr>, <td>, <hl –h6>, <p>, , <font>, <img>, Description and exemplification of: ♦ cascading style sheets ♦ client side scripting (including form validation and alerts) Description of the use of server side scripting and php.
	Description and identification of the characteristics of site design with reference to: ♦ page structure and layout ♦ uniformity of presentation (including use of style sheets, server-side scripting, dynamic pages) ♦ download efficiency ♦ browser compatibility issues
Description and exemplification of the creation of web page with links to other pages on same site.	Description and exemplification of the creation of a multi-paged web site.

National Unit Specification: support notes (cont)

UNIT The Internet (Higher)

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Candidates will require individual access to appropriate computer hardware and software throughout this Unit.

The two Outcomes should be delivered in an integrated way. Appropriate practical activities should be taught and used to illustrate and exemplify the knowledge and understanding required for Outcome 1. These practical activities can be used to generate evidence for Outcome 2.

Candidates who have completed *The Internet* Unit at Intermediate 2 level should already have covered the content listed in the left-hand column of the content grids, but may well need to revise this material before progressing to the right-hand column.

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:

Internet fundamentals	12 hours
Services and resources provided by the Internet	8 hours
Internet developments	4 hours
Construction of Internet web site	12 hours

1½ hours should be set aside to:

a) administer the Outcome 1 test
b) 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 The Internet (Higher)

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 the context of a number of relatively small tasks. The skills will normally be demonstrated by the candidate as part of 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). The practical skills should be demonstrated in the context defined in the content statements (see Information Systems (Higher) Course Content).

To gain success in this Outcome, the candidate must demonstrate practical skills at an appropriate level in each of the following contexts, defined in the content statements (see Information Systems (Higher) Course content):

- use of HTML coding (including layout tables) in web page design
- use of client side scripting in web page design
- use of a cascading style sheet in web site design
- creation of web pages forming multi-page web site with links to other pages on same site

Hard copy evidence should be provided demonstrating two of these skills. Note that this need not be formal documentation — print outs and screen shots showing appropriate activities are adequate — and that one hardcopy might show evidence of more than one skill.

An 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).