Higher National Unit Specification

General information for centres

Unit title: Internet: Web Development

Unit code: DF60 35

Unit purpose: This Unit is designed to provide candidates with essential Web design and authoring skills with an underpinning knowledge of factors affecting Web development.

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

1. Describe factors influencing the development of World Wide Web (WWW) documents.
2. Plan and design World Wide Web documents
3. Use the features of a development language to produce World Wide Web documents
4. Publish, test and evaluate World Wide Web documents.

Credit value: 2 HN Credits at SCQF level 8: (16 SCQF credit points at SCQF level 8*)

**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 recommended that candidates should have some prior knowledge and skills in Computing/IT. This may be evidenced by the possession of relevant National Units, HN units or 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: 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.

Assessment: This Unit will be assessed with a minimum of two assessments. Outcome 1 will be assessed separately by means of written and restricted response questions. Outcomes 2, 3 and 4 are to be assessed by means of a case study, scenario or small project

Higher National Unit specification: statement of standards

Unit title: Internet: Web Development

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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 factors influencing the development of World Wide Web documents.

Knowledge and/or skills

- Define the World Wide Web
- Current development standards
- Emerging development technologies
- Development tools and techniques
- Facilitating and influencing search engine indexing and results
- Use of plug-ins and scripting languages
- Physical factors affecting development

Evidence requirements

The candidate will need evidence to demonstrate his/her knowledge by showing that they can:

- Describe the concept of the World Wide Web as a subset of the Internet;
  - The description should make reference to browsers, hyperlinks, text, graphics, mark-up language, URL/URI/IP address.
- Describe a current Web development standard and identify emerging technologies for the development of WWW documents;
- Describe the role of the World Wide Web Consortium (W3C) in promoting standards and interoperability;
- Identify and compare categories of World Wide Web document development tools;
  - Proprietary and Non-proprietary
- Describe methods of influencing search engine indexing and exclusion within a World Wide Web document;
- Identify browser plug-ins, uses, drawbacks, alternatives and trends;
- Describe how a scripting language and cookies can be used to enhance World Wide Web documents;

Higher National Unit specification: statement of standards (cont)

Unit title: Internet: Web Development

- Describe the physical factors influencing the development of World Wide Web documents with reference to digital media and relevant compatibility issues (eg bandwidth, file types, files sizes versus quality and the need for compression techniques, platform and browser).

The assessment for Outcome 1 will take the form of a series of questions that sample a minimum of 60% of the evidence requirements. The instrument of assessment will contain questions that require candidates to identify information and to provide responses in the form of a written description. It is permissible to allow each candidate two sides of handwritten A4 personal research notes to which they may refer when completing the assessment. These notes should not be supplied by the Centre or be the result of a collaborative exercise between candidates and should be submitted with the candidates' assessment responses.

Candidates must gain 60% of the available marks in order to achieve a pass in Outcome 1.

Assessment guidelines

A written response to a question requiring a description would typically be in the region of 20 – 50 words. A response of fewer words may not satisfy fully a description based evidence requirement. It is unlikely that a candidate would exceed 200 words in responding to any given question requiring a descriptive response. Restricted response or missing word questions can be set for the purposes of satisfying identification based evidence requirements.

For complex descriptive questions, it may be advantageous to have separate components to a question where shorter responses can be given (e.g. a three part question).

Opportunities for independent research and further reading should be encouraged.

Outcome 2

Plan and design World Wide Web documents

Knowledge and/or skills

- Analyse requirements
- Identify aims and objectives
- Design specification and test strategy

Evidence requirements

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

- Analyse requirements and define aims and objectives

- Document a suitable design specification incorporating:
  - The purpose of the World Wide Web documents, how the World Wide Web documents are related and/or the main focal point, target audience, accessibility for users with special needs, proposed development scope, technical requirements and limitations/constraints
    - hardware: development system specification, client system requirements;
    - software: development tools, skills, browser and platform interoperability, plug-ins, script, screen resolution, colour-depth, typography and bandwidth considerations
  - Navigation map
  - Storyboard for each of the proposed World Wide Web documents
  - Justification of design decisions, layout, colour scheme, interaction styles and digital media elements
- Maintain an asset log for each of the digital media elements
- Produce a test strategy with test data and methods of end-user acceptance testing, usability and functionality

This Outcome will be assessed by means of a report of approximately 750 words documenting the aims and objectives and detailing the design decisions taken. A navigational map, storyboards, assets list, test plan with expected results and acceptance tests will be attached as appendices and updated as required.

Assessment guidelines

It may benefit the candidate if they were to become familiar with the concepts, knowledge and skills being conveyed in outcome 3 prior to undertaking a formal instrument of assessment for outcome 2. It is recommended that candidates be provided with opportunities to gain an awareness of the features, specifications and limitations of the chosen development language and of any other relevant factors that may influence the candidates planning and/or design decisions.

It is recommended that a holistic approach be taken to generating assessment evidence and that this outcome be combined with outcomes 3 and 4, thus permitting assessment to take the form of a small project relating to the development of approximately five World Wide Web documents. It would be advantageous if the centre were to prepare a project brief, scenario or case study for the candidate to work from. An example would be an on line curriculum vitae.

Outcome 3

Use features of a development language to produce World Wide Web documents.

Knowledge and/or skills

- Produce documents suitable for publishing on the WWW
- Incorporate text and digital media content

Higher National Unit specification: statement of standards (cont)

Unit title: Internet: Web Development

- Use features of the development language to structure and organise browser visual content
- Control presentation style and layout consistency across WWW documents
- Use form components to facilitate user input within a WWW document
- Use script or suitable alternative to validate user input and provide feedback
- Incorporate code to influence search engine indexing and results
- Conform to recognised standards for structural and syntactical integrity of code

Evidence requirements

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

- Adhere to recognised structural and syntactical standards of the development language in the production of interoperable, non-browser specific documents suitable for publication to a World Wide Web server
- Set document title and page properties (background colour/image, margins, default colour for text and the various hypertext states)
- Incorporate text content and manipulate properties and attributes of text content
  - headings, font (face, style, colour, size), alignment (left, right, centre, justified), breaks, paragraphs, indent and out dent
- Incorporate image content within World Wide Web documents and manipulate image properties and attributes (height, width, alignment, alternative text)
- Link to other online documents through text and image content (absolute and relative reference, external World Wide Web documents, open in a new browser window, link to at least one other MIME type)
- Structure visual layout by incorporating:
  - lists (ordered, unordered),
  - tables (row, column, cell, padding, spacing, border, colour, relative and absolute sizing, horizontal and vertical alignment, nested tables),
  - layers (size, position),
  - use of templates
- Use a style sheet or suitable alternative to centralise, manage and control presentational style, layout and consistency of multiple World Wide Web documents (colour schemes, fonts etc.)
- Create a frameset and provide support for browsers that cannot display frame content
- Incorporate an image map
- Incorporate form components (text field, text area, select box, checkbox, option buttons, submit and reset buttons, hidden and required fields)
- Use features of the development language or supported scripting language to provide simple form content validation and feedback about successful/unsuccessful form submission (missing mandatory data, invalid data type, exceeds maximum string length)
- Include non-browser displayed content (meta head content: keywords and description)
- Define suitable site and directory structure using interoperable naming conventions

- Optimise code to comply with the validation tools of the development language

- Demonstrate competence in the use of advanced features of a Web authoring tool
- Resolve development issues through the use of supported debug and help facilities

Evidence to show competence in using an authoring tool will be demonstrated by means of a small project that integrates with Outcomes 2 and 4.

At least five World Wide Web documents must be produced sampling a minimum of 60% of the evidence requirements from Outcome 3. Text, text properties, headings, sub-headings, graphical content, a list, a table, a nested table, a form, non-displayed content (e.g. metadata), hypertext and hyperlinks must be included and assessed within the project. All documents should conform to recognised standards and be supported by major World Wide Web browsers unless the candidate has provided sound reasons for not doing so in Outcome 2. All redundant code should be removed. Documents should be validated using an appropriate method.

Assessment guidelines

Assessment for Outcome 3 may take the form of a series of short practical exercises over an extended period of time. It would be advantageous if the candidate were to be able to demonstrate proficiency in using the development language without relying on a WYSIWYG authoring tool - unless being utilised for advanced features (eg layers, image maps, behaviours, library script or templates). In all cases, the candidate should be aware of the purpose of code and be able to edit raw code.

On completion of the checklist, competence in using an authoring tool could be demonstrated by means of a small project that integrates with Outcome 2 and Outcome 4, thus providing a more holistic approach to gathering evidence.

Outcome 4

Publish, test and evaluate World Wide Web documents

Knowledge and/or skills

- Upload
- Test and debug
- Promote
- Evaluate

Higher National Unit specification: statement of standards (cont)

Unit title: Internet: Web Development

Evidence requirements

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

- Transfer all relevant files to remote server
- Test published WWW documents using a test plan
- Debug post-publishing issues
  - A log should be maintained with details of uploaded file modifications
  - A bug report should be produced where constraints prevent correction of known bugs
- Carry out end-user acceptance testing
- Submit URL/IP address to appropriate search engines and/or directory services
- Evaluate final product by addressing the main development issues through to the final solution with reference to feedback from the target users and comment on accessibility (including users with special needs), usability, functionality, adherence to original aims and objectives, use of technologies, problems encountered and details of how problems were addressed
- Make recommendations for future improvement and development

This outcome will be assessed by means of an observation checklist, logs or screen dumps, test results and an evaluation report of approximately 500 words. The evaluation report must address the following development issues: accessibility, functionality, usability, adherence to aims and objectives, use of technologies, problems encountered, feed back from end-users (or from a cognitive walkthrough) and must make recommendations for future development/enhancements. To satisfy the final two evidence requirements of Outcome 4, the candidate must gain a minimum of 60% of the available marks for the evaluation report.

Assessment guidelines

It is recommended that a holistic approach be taken and that this outcome be combined with outcomes 2 and 3, thus permitting assessment to take the form of a small project relating to the development of approximately five World Wide Web documents.

Administrative Information

Unit code: DF60 35

Unit title: Internet: Web Development

Superclass category: CB

Date of publication: December 2003

Version: 02 (May 2006)

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

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of Higher National qualifications.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Customer Contact Centre for further details, telephone 0845 279 1000.

Higher National Unit specification: support notes

Unit title: Internet: Web Development

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 80 hours.

Guidance on the content and context for this Unit

This Unit is intended to provide candidates with the knowledge, skills and an understanding of designing, developing, publishing, testing and evaluating documents suitable for the World Wide Web.

The Unit has been designed to support a mark-up language as the basis for delivery. However, Centres may opt for the implementation language and tools most suited to their own local needs and/or resources.

At the time of writing, the predominant mark-up language is HTML 4 (for further details, please refer to the World Wide Web Consortium HTML 4.01 Technical Specification). It is anticipated that the HTML 4.01 specification will be superseded as the mainstream mark-up language by an extensible variation of HTML. In situations where the candidate has existing knowledge of a mark-up language such as HTML 4, Centres may wish to consider delivery of the Unit using an extensible mark-up language (eg XHTML), extensible mark-up specification (e.g. XML) and extensible style language (eg XSL). Note that Document Type Definitions (DTD's) and XML Schema go beyond the scope for which this Unit is intended.

Outcome 1 is theory based and focuses on factors influencing the development of mainstream World Wide Web documents. The Outcome begins by encouraging the candidate to become aware of the concept of the World Wide Web and how it relates to the Internet. It may be advantageous to provide the candidate with a superficial knowledge of common Internet services such as e-mail, Usenet, FTP and IRC in order to make a clearer distinction of what the World Wide Web is. The Outcome progresses to examine current development standards and emphasises the importance of interoperability between platforms and browser technologies. The candidate will examine the role of the World Wide Web Consortium (W3C) as a vendor neutral, non-profit making international body, set up by Tim Berners Lee in 1994, with the aim of promoting standards and specifications for interoperability. The candidate would benefit from a general insight as to how a mark-up language such as HTML 4.01 operates (tags/elements, structuring and formatting of text and the inclusion of digital media) and the concept of interlinking documents using hypertext/links to form a 'web' like structure.

The Outcome also aims to raise the candidate's awareness of emerging Web development technologies - examples include the emergence of server-side, database driven technologies such as ASP, JSP, PHP and extensible languages/specifications as an increasingly preferred

choice over traditional static web content. Scope exists to shift the focus to truly emerging technologies. At the time of writing, this would include developments in the mobile and wireless field (e.g. WAP, 3G and Bluetooth), X3D and Scalable Vector Graphics. The candidate would not be expected to gain depth of knowledge of emerging technologies, therefore, a very brief overview or awareness that these technologies exist and the future implications of such technologies will suffice.

Candidates will learn about the various categories of development tool (including proprietary tools such as Macromedia Dreamweaver, Non-proprietary tools such as Microsoft Word and simplistic ASCII/text tools such as Microsoft Notepad). Scope exists to investigate the use of plug-in and/or Active-X components, scripting languages and cookies.

Physical factors are taken into consideration along with the general issues that a Web developer should be aware of. This could be the physical resources of the typical end-user where the candidate could take into consideration issues concerning compatibility of file types, bandwidth, file size versus file quality, the need for compression of digital media (lossy/lossless), interoperability of code and digital media between browser technologies and platforms. The candidate would benefit from an overview of methods used by Web developers in influencing search engine indexing ranking and also of the steps that can be taken to help avoid certain content from being automatically indexed by passing search engine robots, spiders or other automated indexing tools (eg Meta tags, robots.txt).

Opportunities for practical activities that serve to enhance the learning experience of the candidate are to be encouraged, especially where the concepts being conveyed can be demonstrated through practical means.

Outcome 1 is intended to raise awareness within the candidate. It is not intended to provide depth of knowledge. The suggested lecture based timescale for this Outcome is 15 hours.

Outcome 2 is concerned with the planning and design of documents suitable for publishing on the World Wide Web. Prior to embarking on this Outcome, the candidate may benefit greatly from an understanding of the concepts being conveyed in Outcome 3. As such, it is suggested that the content of Outcome 3 be delivered before Outcome 2. In doing so the candidate would have had the opportunity to gain substantial practical development experience and would be better equipped to complete Outcome 2 through their awareness of the development language and its limitations. Outcomes should not necessarily be assessed in this order. It is recommended that assessment follow a more linear path: Outcome 2 followed by Outcome 3 and Outcome 4.

In Outcome 2 it is important that the candidate be able to analyse a problem and identify aims and objectives (this can be as simple as the candidate stating clearly and concisely what it is that they are trying to do and how they intend to go about doing it). The candidate could

extend this to identify the target audience and define a reasonable scope of development. Scope could include factors such as the technical requirements, skills, limitations and any constraints. The evidence requirements for this section are generally self-explanatory. A simple navigation map will clearly show how the candidate intends to sequence and link documents. A storyboard will be produced for each of the proposed documents. Preferably these will be hand drawn and illustrate layout, colour scheme and refer to typography. Centres should recognise that the electronic document may differ from the original storyboard. However where the difference is significant, the Centre may request that the candidate update their storyboards accordingly. It is recommended that the Centre produce a storyboard pro-forma. It is advisable that a spreadsheet be used to record a digital media asset log. Ideally a separate worksheet would be used for each media type (graphics, audio, video, animation). An asset log of graphics may typically contain the following information about each graphical element: *Filename (compressed), File Type, Bit Depth, Dots Per Inch, Height, Width, Size (Kb), Date, Filename (editable original), File Type, Location of media on disk, Copyright and Source (where graphic was originally sourced from).* The information would be added to, updated and maintained throughout the development life cycle. Centres may customise asset log headings to suit local delivery needs. It is important that the candidate gives due consideration to the quality of the end product (including accessibility, usability and functionality). As such a test strategy with test data incorporating these factors could be produced and used later in Outcome 4 as part of the testing process. End-user acceptance tests may take the form of surveys or questionnaires where the candidate can reflect on the information gathered and effectively incorporate their findings into the Outcome 4 evaluation report. It would be advantageous if test data and questionnaires/surveys were developed during the planning and design phase within Outcome 2. The candidate may also make use of cognitive walkthroughs for testing and evaluation purposes.

Outcome 3 is practical in nature and aims to provide the candidate with opportunities to gain an understanding of the development language and tools. It is recommended that the general content of Outcome 3 be delivered before Outcome 2. This would enable the candidate to gain an understanding of the development language and allow him/her to gain an awareness of what can realistically be achieved. Ideally this would take the form of a lecturer-led exposition with relevant supporting notes, slides or teaching aids with a series of short practical exercises that encourage the candidate to put theory into practice. To illustrate: if HTML 4 were to be used as the development language, the candidate could perhaps start by learning about the uses, limitations and structure of HTML documents and about basic HTML elements/tags (e.g. <HTML>, <HEAD>, </HEAD>, <TITLE>, </TITLE>, <BODY></BODY> and </HTML>). The candidate could then demonstrate their knowledge and understanding of the concepts being conveyed and apply these to create a simple World Wide Web document incorporating each of the tags learned. This would essentially form the basis from which subsequent sessions would build. To extend the example: in a further session the candidate may be introduced to additional elements, properties and attributes such as <B>, </B>, <I>, </I>, <U>, </U>, <FONT *colour*>, <FONT *face*>, </FONT>, <HR>, <P>, <BR>, <DIV>, <H1>, <H2>, etc.

A subsequent session could extend knowledge further by introducing how to incorporate images, anchor tags, lists and tables. It would be beneficial if the candidate were to gain hands-on practical experience of producing World Wide Web documents in the first instance by using a simple text editor such as Microsoft Notepad. After the initial learning curve of the implementation language has been achieved, it would be appropriate for the candidate to begin to gain experience of using a WYSIWYG authoring tool. Candidates should be encouraged to spend time examining the code produced by the authoring tool and acquire the ability to identify and remove unnecessary code inserted by the authoring tool. Assuming that HTML was to be used as the development language, the candidate may use an authoring tool such as Macromedia Dreamweaver to produce advanced content such as image maps and layers (where supported). Again, it is important that the candidate be encouraged to examine the code produced by the authoring tool. The Centre may supply pre-written script content to the candidate for the purposes of validating form content. However, it is recommended that the candidate insert the script into their code with minimal assistance. Where possible, it would be advisable if all World Wide Web documents produced by the candidate for assessment purposes were to conform to W3C standards and successfully validate against W3C online tools or an appropriate alternative. At the time of writing, the W3C HTML 4.01 online validation tool was located at *http://validator.w3.org*.

Outcome 4 requires the candidate to publish, test and evaluate their World Wide Web documents. It would be beneficial to the candidate if they were to use the File Transfer Protocol (FTP) for the purposes of uploading their documents to the server. A brief explanation of FTP may also be beneficial to the learning experience. Documents would ideally be uploaded to a remote server that is accessible to World Wide Web users and for the URL or IP address to be submitted to search engines. Where this is not possible, the local host (127.0.0.1) or an intranet server can be used. In the case of the latter, the candidate would benefit from going through the motions of submitting their URL to a search engine and taking screen dumps for evidence requirements. Testing can be completed using different browsers (e.g. Internet Explorer 5 and 6, Netscape Navigator, Opera), using different screen resolutions (e.g. 640x480, 800x600, 1024x768, etc), different colour depths or pallets (web safe colours) and different platforms. The extent of testing may depend on the resources of the Centre. Centres should encourage candidates to use their test data to test the resilience of their end product and actively seek out bugs, logging and rectifying these where possible. A cognitive walk-through would also be appropriate. End-user acceptance testing should be encouraged. This may take the form of a survey, questionnaire or simple feedback/grading form. The aim of the evaluation report is to encourage the candidate to reflect on their work and to re-examine their original aims and objectives and identify strengths and weaknesses, taking into consideration the feedback from end-users and suggesting actions/recommendations.

Higher National Unit specification: support notes (cont)

Unit title: Internet: Web Development

Guidance on the delivery and assessment of this Unit

Outcome 1 is theory based and can be delivered and assessed on its own. At this level, the knowledge gained by the candidate is likely to be somewhat superficial. Centres are encouraged to seek opportunities that serve to enhance the student learning experience. This could perhaps be achieved by introducing practical activities or tutor-led demonstrations of the concepts being conveyed. The instrument of assessment for Outcome 1 should be entirely theory based and take the form of a series of questions that have been written in such a way that they cover a minimum of 60% of the Outcome and evidence requirements. A written response to a question requiring a description would typically be in the region of 20 – 50 words. A response of fewer words may not satisfy fully a description based evidence requirement. It is unlikely that a candidate would exceed 200 words in responding to any given question requiring a descriptive response. Restricted response or missing word questions can be set for the purposes of satisfying evidence requirements that require the candidate to identify information. For complex descriptive questions, it may be advantageous to have separate components to a question, thus allowing shorter focussed responses (e.g. a three part question). A marking scheme with a threshold of achievement would be beneficial. The threshold in which a candidate can be deemed to have reached the minimum pass standard should be set at 60% of the available marks within the instrument being used. Candidates should not be aware of the questions beforehand but need only cover 60% of the total evidence requirements. Due to the volume of technical information and because this assessment is to be completed under supervised conditions, it would be permissible to allow each candidate two sides of handwritten A4 personal research notes to which they may refer when completing the instrument of assessment. These notes should not be supplied by the Centre or be the result of a collaborative exercise between candidates. Research notes should be submitted with the candidates' responses. It is recommended that 15 hours be allocated to the delivery of this Outcome. Delivery can be tailored to suit local needs. For example, some centres may prefer to complete this outcome within the first or the last 15 hours of the Unit delivery schedule. Other centres may prefer to deliver Outcome 1 by allocating, for example, 1-hour of a 3-hour session over 15 sessions. The remaining 2-hours of each session could then be used for the delivery of Outcomes 2, 3 and 4. It is recommended that assessment time be in addition to the suggested 15 hours and that a further two hours be set aside for a closed book instrument of assessment, sampling a minimum of 60% of the Outcome 1 evidence requirements.

Outcomes 2, 3 and 4 are to be assessed by means of a case study, scenario or small project. It is recommended that Centres progress directly to Outcome 3 on completion of Outcome 1. It is recognised that a candidate with little or no experience of the chosen development language may find it difficult to complete Outcome 2 to a satisfactory standard without first having the opportunity to gain fundamental knowledge of the chosen development language (e.g. HTML). It is suggested that this be achieved by means of hands-on practical experience. Lecturer-led exposition with relevant supporting notes, slides or teaching aids and a series of short practical exercises that encourage the candidate to put theory into practice would be ideal. As a guideline, a candidate may take approximately 35-hours to reach the standard

outlined in the evidence requirements for Outcome 3. This does not include time to complete the assessment. It is suggested that a simple checklist covering the evidence requirements of Outcome 3 be used in the first instance. It is recommended that further evidence be generated on a sampling basis (minimum sample is 60%) as part of a case study, scenario or small project that integrates Outcomes 2, 3 and 4.

A candidate, having been through the delivery of Outcome 3, may be better placed to gain a fuller appreciation of Outcome 2. The candidate may also benefit from the opportunity to participate in a tutor/mentor led activity involving the examination of good and bad web page design based on existing examples sourced from the World Wide Web. This could perhaps be for a common theme (eg music site, book store or online retail outlet). Layout, colour scheme and complementary web-safe colours, typography, aesthetics, screen resolution, content, relevance to audience, ease of use, functionality, usability, interactivity, use of plug-ins, scripting and interoperability and access for users with disabilities could be investigated and may serve to enhance the candidate learning experience.

Candidates will produce a critical evaluation report of approximately 500 words to meet the final two evidence requirements of Outcome 4. The candidate will be required to gain a minimum of 60% of the marks available for the evaluation. Given the scope for content within the evaluation report, a marking scheme with percentages allocated to bands might be most the appropriate (e.g. Satisfactory .. 60%; Good .. 70%; Excellent .. 80%+).

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
DF60 35	Internet: Web Development	20				

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

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.

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 of 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: Web Development

This Unit is designed to provide you with the knowledge and skills required to create efficient, effective and comprehensive World Wide Web documents using a variety of techniques — including a simple text editor and an industry standard Web authoring tool.

Outcome 1 is theory based and serves to build your awareness of the current factors affecting the development of World Wide Web documents. Outcome 1 examines current standards for developing World Wide Web documents and investigates emerging standards – in particular, those endorsed by the World Wide Web Consortium (W3C). At the time of writing, factors that would have been taken into consideration would have included: server-side web technologies such as XML, PHP, JSP, ASP, .NET, webdav, delivery of media to mobile and DITV devices, broadband, X3D and Scalable Vector Graphics.

You will examine a range of Web authoring tools including simple text editors such as notepad, proprietary packages such as Dreamweaver, and non-proprietary tools such as Microsoft Word, identifying their strengths and weaknesses and giving examples of how each may be used within an industrial environment. You will understand how search engine results can be influenced through the use of Meta tags and identify steps that can be taken to optimise and/or exclude content from being indexed by a search engine such as robots and spiders. You will take time to investigate the use of browser plug-ins, examining their uses and identifying potential limitations of use including bandwidth constraints.

Outcome 2 requires you to effectively plan and design your Web application, taking your target audience and users with special needs into consideration. You will manage your time carefully and design your Web application in line with the supplied client brief or scenario, identifying the most appropriate methods of interaction and highlighting browser and cross-platform compatibility issues. You will use industry standard methods of documentation such as workflow diagrams, navigational maps and storyboards. A low-fidelity prototype and test strategy should be produced prior to progressing to the implementation stage.

Outcome 3 focuses on the implementation of your World Wide Web documents and allows you to gain hands on experience of different tools used to develop World Wide Web documents and essential coding skills. At all times, you will be expected to conform to industry standards in relation to syntax, structure and language constraints. You will incorporate both text and graphical content. The latter may come from an approved image library or be developed as part of the delivery of a unit such as Multimedia Computing: Screen Based Graphics. In the development of your World Wide Web documents you will incorporate a range of elements including head and meta elements, links, frames, tables, layers, a style sheet, an image map, user input forms and script based feedback.

Outcome 4 requires that you publish your completed Web application to a suitable Web server using the File Transfer Protocol. Once published, you must fully test your Web application against the tests devised as part of your test strategy and the URL submitted to at least one relevant search engine or online directory. Finally, your Web application must be critically evaluated against its original aims and objectives. The evaluation will be in the form of a report of approximately 750 words.