

Higher National Unit Specification

General information for centres

Unit title: Internet: Client Side Web Scripting

Unit code: DF6P 35

Unit purpose: This Unit is designed to provide candidates with a practical understanding of client-side Web scripting and become proficient in designing and implementing scripts within Web documents.

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

1. Use the features of a client side web scripting language
2. Use a client side scripting language to enhance the functionality of a Web document

Credit value: 1 HN Credit at SCQF level 8: (8 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 is at the discretion of the centre. However, it is recommended that candidates have at least a basic understanding of elementary programming constructs and knowledge of developing World Wide Web documents and form components. It is recommended that candidates have completed the HN Units DF6C 34 *Software Development: Introduction* and DF60 35 *Internet: Web Development* or similar Units before this Unit.

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.

General information for centres (cont)

Assessment: This Unit is assessed by a single holistic instrument of assessment requiring candidates to devise and implement a solution to a given problem or set of problems using a variety of scripting techniques designed to enhance functionality within a Web document or series of Web documents. The threshold of achievement is 60% of the total available marks. The assessment should be carried out under conditions sufficient to ensure confidence in the authenticity of candidates' submission.

Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, knowledge and/or skills, and evidence requirements are mandatory.

Please refer to Knowledge and/or skills for the Unit and Evidence requirements for the Unit after the Unit Outcome.

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

Use the features of a client side web scripting language

Knowledge and/or skills

- ◆ Declaring and making use of variables and arrays
- ◆ Implementing control structures and utilising appropriate language constructs
- ◆ Using operators, functions, methods, events and event handlers
- ◆ Implementing methods of data input, extraction, validation and output
- ◆ Browser and plug-in detection

Outcome 2

Use a client side scripting language to enhance the functionality of a Web document

Knowledge and/or skills

- ◆ Add functionality to a form within a web document
- ◆ Add interactivity or enhanced usability to a Web document using script
- ◆ Maintaining quality of implemented program code
- ◆ Testing and debugging of the solution

Higher National Unit specification: statement of standards (cont)

Unit title: Internet: Client Side Web Scripting

Evidence requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can design and implement a solution to a given problem or set of problems using a variety of scripting techniques to enhance functionality within a Web document or series of Web documents. The implemented solution must contain evidence of at least the following:

- ◆ Variables and arrays appropriately defined, named and initialised and used;
- ◆ Control structures must be used appropriately including at least:
 - Sequence, selection, iteration (conditional, unconditional) and nesting of control structures;
- ◆ Arithmetic and logical operators must be used appropriately;
- ◆ User defined or predefined functions must be used appropriately;
- ◆ Events must be handled appropriately and methods assigned;
- ◆ Input must be accepted and retained in memory, including:
 - Form component input or script input dialog;
 - Check for existence before reading from file (e.g. cookie or text file);
 - Read from file (e.g. cookie or text file);
- ◆ Selected user input must be validated for compliance using script;
- ◆ Selected user input must be extracted, manipulated and output, including:
 - Output to screen (e.g. form results);
 - Output to file (e.g. cookie or text file);
- ◆ Deletion of written file that is no longer required (e.g. expired cookie);
- ◆ Detection of either a plug-in, browser technology or browser script support;
- ◆ Apply features of a scripting language to a form within a Web document;
- ◆ Use features of a scripting language to add interactivity or extended usability to a Web document;
- ◆ Maintain code readability using internal documentation and indentation in accordance with organisational standards;
- ◆ Test code and debug and/or rewrite code as required for:
 - Errors, browsers, browser versions and platform compliance;

This assessment will be completed over an extended period under supervised conditions sufficient to ensure confidence in the authenticity of individual candidate's submissions.

Candidates must gain 60% of the total marks available to achieve a pass in this Unit. In the event that script does not function as expected, candidates may still achieve a pass on the condition that bugs are documented and understood by the candidate to a standard deemed acceptable by the centre and where the total mark gained is equivalent to or greater than 60%.

Higher National Unit specification: statement of standards (cont)

Unit title: Internet: Client Side Web Scripting

Assessment guidelines

It is recommended that the assessment should take the form of an appropriate case study or scenario. Candidates who have access to a suitable workplace may base their assessment work on suitable client-side web scripting situations drawn from their place of work.

Administrative Information

Unit code:	DF6P 35
Unit title:	Internet: Client Side Web Scripting
Superclass category:	CE
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Higher National Unit specification: support notes

Unit title: Internet: Client Side Web Scripting

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.

Guidance on the content and context for this Unit

This Unit has been designed to address the need for candidates to acquire scripting knowledge and skills that may be used to enhance functionality within standard mark-up language (e.g. HTML) documents.

It is recommended that candidates undertake this Unit after they have completed the HN Units “Internet: Web Development” and “Software Development: Introduction”.

Internet: Client Side Web Scripting may serve as an ideal pre-cursor to the HN Unit “Software Development: Developing for the WWW” and as a means of preparing a candidate for study related to server-side scripting. At the time of writing, JavaScript, VBScript or Macromedia Flash ActionScript would be among the client-side scripting language considered suitable for use with this unit. However, centres may opt for a client-side scripting language that fits best with local delivery needs.

This Unit contains two outcomes which should be assessed holistically. Outcome 1 aims to instil fundamental scripting skills by means of controlled exploration. Outcome 2 aims to challenge the knowledge and skills acquired by the candidate in Outcome 1 by requiring that a solution to a problem or set of problems be devised, implemented and tested.

Outcome 1

Candidates should learn how to define, describe, initialise and use variables and arrays using the scripting language. Candidates should use the scripting language to implement: control structures for sequence, selection and iteration (conditional and unconditional) and use nested control statements; operators (logical, Boolean, comparison and arithmetical); parameter passing; functions; methods and events. Candidates should gain experience in handling data input, extraction, validation, manipulation and of outputting the data to the screen and to a file (e.g. as a cookie). Additional features such as plug-in and browser detection, alert boxes, motion and custom scripts may also be explored. The scope is extensive. Some candidates may encounter a steep learning curve. Due caution should be given to avoid overburdening candidates. The main aim of this Outcome is to instil within candidates a solid set of scripting skills that can be used in Outcome 2 and provide a basis on which candidates can expand upon for use within industry. It is suggested that the different ways browsers handle scripting languages is dealt with at as early a stage as possible and that solutions for dealing with different browsers (including browser detection) are considered.

Higher National Unit specification: support notes

Unit title: Internet: Client Side Web Scripting

Outcome 2

Candidates should use the knowledge and skills gained in Outcome 1 to devise, implement and test a solution to a problem or set of problems requiring functionality to be added to one or more Web documents. Centres may wish to supply candidates' with pre-written Web documents to which script that adds functionality must be incorporated. Candidates will be expected to add functionality to a form and add interactively at least one web document. Readability of the script should be stressed and candidates encouraged to: indent code; use sensible naming conventions; produce logical structures and make ample use of internal documentation to explain the purpose of script sections. Once a solution has been designed and implemented, it would be appropriate for candidates to thoroughly test their script for bugs, browser and (where feasible) platform conformity. Candidates are encouraged to debug all scripting errors and document those to which a fix cannot be made.

Some candidates may wish to progress their skills beyond the evidence requirements - this is to be encouraged, however, caution should be given to ensure that the evidence requirements are being met.

Guidance on the delivery and assessment of this Unit

This Unit should take approximately 40 hours to complete. It is recommended that, approximately twenty-five hours should be spent on the delivery of Outcome 1 and ten hours should be allocated to the delivery of Outcome 2. The assessment should take approximately five hours. Candidates should be encouraged to spend at least a further 40 hours developing their scripting skills in their own time.

This Unit may be delivered as a stand alone Unit or as part of a group award. At the centres discretion, it is possible that this Unit could be delivered as part of the Higher National Certificate. However the Unit may sit more comfortably as a second year HND Unit. It is recommended that candidates complete the HN units "Internet: Web Development" and "Software Development: Introduction" prior to commencement of this Unit. This Unit is also an ideal precursor to the HN Unit "Software Development: Developing for the WWW".

Candidates should have access to a computer system with a text editor and various web browsing applications installed. At the time of writing, access to Internet Explorer v4, v6, Opera v7 and a version of Netscape Navigator would be appropriate. Access to Linux, Apple MacIntosh and Windows operating systems and browser software would also be beneficial. Access to the likes of WAP and 3G devices would be an added bonus.

Higher National Unit specification: support notes (cont)

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To maximise candidates learning experiences, Outcomes 1 and 2 should be assessed holistically. Supplementary problems to be solved should be included within the instrument of assessment where an evidence requirement is not being met in full by the main problem, scenario or case study. The threshold of achievement for candidates to achieve a pass in this Unit is 60% of the total marks available.

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: Client Side Web Scripting

This Unit is designed to enable you to understand the concepts of client side web scripting, and to enable you to gain hands-on experience of designing and implementing scripts to deal with common problems associated with Web documents.

On completion of the unit you should be able to:

1. Use the features of a client side web scripting language
2. Use a client side scripting language to enhance the functionality of a Web document

In Outcome 1 you will learn how to use the scripting language to solve common problems by gaining key skills in the use of variables and arrays, implementation of control structures for sequence, selection and iteration (conditional and unconditional) and the use of nested statements, operators (logical, Boolean and arithmetical), parameter passing, functions, methods and events. You will also gain experience of handling data input, extraction, validation, manipulation and of outputting the data to the screen and to a file (e.g. as a cookie). Additional features such as plug-in and browser detection, alert boxes, motion and custom scripts may also be explored. The main aim of this Outcome is to provide you with a solid set of scripting skills that can be used in Outcome 2 and as a basis on which you may wish to expand for future use within industry.

In Outcome 2 you should learn how to devise, implement and test a solution to a problem or set of problems which require functionality to be added to one or more Web documents. This should include interaction and functionality to form components. An emphasis should be placed on readability of code and you should be encouraged to follow industry standards of internal documentation in explaining the purpose of script sections. Having developed a solution, you will test the script for bugs, debug as appropriate and test for browser/platform conformity.

There should be one assessment for this Unit. This will be completed over an extended period under supervised conditions. The assessment is likely to take the form of a case study or scenario and should require you to develop a solution to a problem or series of smaller problems. In order to achieve a pass in this Unit you will need to gain a minimum of 60% of the available marks.