



## Higher National Unit specification

### General information for centres

**Unit title:** Internet and Network Technology Fundamentals

**Unit code:** F204 34

**Unit purpose:** This Unit is designed to introduce candidates to the knowledge and understanding of services, theoretical concepts and principles of Internet technologies. Candidates will be introduced to the configuration and the effective use of popular web client applications (eg browsers, e-mail clients, etc.) in the context of Internet protocols and networking concepts. Other topics include introduction to Internet addressing and common internetworking server types. On completion of the Unit the candidate should be able to:

- 1 Define networks, the Internet, Internet protocols and the Domain Name System (DNS).
- 2 Configure and use web browsers for secure browsing, web searching, and accessing multimedia.
- 3 Install, configure and troubleshoot e-mail, FTP, and SSH clients.
- 4 Identify network addressing, components, architectures, topologies and major network operating systems.
- 5 Describe the functions of common internetworking server types in relation to Internet protocols.

**Credit points and level:** 1 HN credit at SCQF level 7: (8 SCQF credit points at SCQF level 7\*)

*\*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. It is not necessary for candidates to have prior experience in using the Internet or configuring networks. However, candidates should be familiar with a computer operating system.

**Core Skills:** There are no opportunities to develop Core Skills in this Unit.

**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:** Evidence is required that candidates have achieved all Outcomes.

Written and/or oral recorded, performance and product evidence is required which demonstrates that the candidate has achieved the requirements of all of the Outcomes to show that the candidate has appropriate knowledge and understanding of the content of this Unit.

This Unit should be assessed by the following:

- 1 Outcome 1 is a closed-book assessment and should take the form of a set of objective questions. This assessment can be combined with the assessment(s) for Outcomes 2, 3, 4 and 5. This assessment must be carried out under supervised conditions.
- 2 Outcome 2 is a closed-book assessment and should take the form of a set of objective questions. This assessment can be combined with the assessment(s) for Outcomes 1, 3, 4 and 5. This assessment must be carried out under supervised conditions.
- 3 Outcome 3 is a closed-book assessment and should take the form of a set of objective questions. This assessment can be combined with the assessment(s) for Outcomes 1, 2, 4 and 5. This assessment must be carried out under supervised conditions.
- 4 Outcome 4 is a closed-book assessment and should take the form of a set of objective questions. This assessment can be combined with the assessment(s) for Outcomes 1, 2, 3 and 5. This assessment must be carried out under supervised conditions.
- 5 Outcome 5 is a closed-book assessment and should take the form of a set of objective questions. This assessment can be combined with the assessment(s) for Outcomes 1, 2, 3 and 4. This assessment must be carried out under supervised conditions.

Outcomes can be integrated into the one assessment. Where an assessment consists of one or more Outcomes, assessment questions can be derived from a short case study which specifies a scenario and several problems. The candidate could then be asked to address the problems with relation to the case study. The case study could be handed out immediately prior to the assessment so that a candidate can read this without taking part of the assessment time.

An assessor must ensure that a candidate has achieved each Outcome within the Unit.

Assessors should ensure themselves of the authenticity of the candidate's evidence.

## **Higher National Unit specification: statement of standards**

**Unit title:** Internet and Network Technology Fundamentals

**Unit code:** F204 34

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**

Define networks, the Internet, Internet protocols and the Domain Name System (DNS)

#### **Knowledge and/or Skills**

- ◆ Define computer networks
- ◆ Internet connection methods
- ◆ Describe Internet protocols
- ◆ Structure of the Domain Name System (DNS)

#### **Evidence Requirements**

Outcome 1 is a closed-book assessment and should take the form of a set of objective questions. This assessment must be carried out under supervised conditions. Evidence of the Knowledge and/or Skills will be assessed using a representative sample of questions covering the bullet points below:

- ◆ define the different types of computer networks available
- ◆ identify different types of Internet connection methods
- ◆ describe Internet protocols
- ◆ explain the structure of the Domain Name System (DNS)

This assessment must change on each assessment occasion. Achievement can be decided by use of a 60% cut-off score.

Where re-assessment is required it should contain a different sample from the range of mandatory content.

#### **Assessment Guidelines**

This assessment can be combined with the assessment(s) for Outcomes 2, 3, 4 and 5. Where an assessment consists of one or more Outcomes, an equal representative set of questions should relate to each Outcome.

It is expected that candidates should be able to complete this assessment in 45 minutes.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Internet and Network Technology Fundamentals

### **Outcome 2**

Configure and use web browsers for secure browsing, web searching, and accessing multimedia.

#### **Knowledge and/or Skills**

- ◆ Structure of a web addresses
- ◆ Configuring browser preferences and security settings
- ◆ Identify the function of proxy servers
- ◆ Using browsers to authenticate and encrypt
- ◆ Define web search engines and web search types
- ◆ Conducting basic and advanced web searches
- ◆ Identifying various media file formats
- ◆ Identifying and installing plug-ins and viewers

#### **Evidence Requirements**

Outcome 2 is a closed-book assessment and should take the form of a set of objective questions. This assessment must be carried out under supervised conditions. Evidence of the Knowledge and/or Skills will be assessed using a representative sample of questions covering the bullet points below:

- ◆ explain the structure of a web address
- ◆ identify the correct configuration preferences and security settings for browsers
- ◆ identify the function of proxy servers
- ◆ define browser functions to authenticate and encrypt data
- ◆ describe web search engines and web search types
- ◆ define how to conduct basic and advanced web searches
- ◆ identify various media file formats used on a network
- ◆ identify and installing plug-ins and viewers

This assessment must change on each assessment occasion. Achievement can be decided by use of a 60% cut-off score.

Where re-assessment is required it should contain a different sample from the range of mandatory content.

#### **Assessment Guidelines**

This assessment can be combined with the assessment(s) for Outcomes 1, 3, 4 and 5. Where an assessment consists of one or more Outcomes, an equal representative set of questions should relate to each Outcome.

It is expected that candidates should be able to complete this assessment in 45 minutes.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Internet and Network Technology Fundamentals

### **Outcome 3**

Install, configure and troubleshoot e-mail, FTP, and SSH clients

#### **Knowledge and/or Skills**

- ◆ Describe e-mail operation and its protocols
- ◆ Configuring an e-mail client
- ◆ Identifying ways to use e-mail effectively in the workplace
- ◆ Describing and using FTP
- ◆ Describing and using SSH
- ◆ Troubleshooting basic Internet problems using TCP/IP tools

#### **Evidence Requirements**

Outcome 3 is a closed-book assessment and should take the form of a set of objective questions. This assessment must be carried out under supervised conditions. Evidence of the Knowledge and/or Skills will be assessed using a representative sample of questions covering the bullet points below:

- ◆ describe e-mail operation and its protocols
- ◆ identify configuration settings for an e-mail client
- ◆ identify ways to use e-mail effectively in the workplace
- ◆ describe File Transfer Protocol
- ◆ describe SSH
- ◆ describe the troubleshooting procedures to solve basic Internet problems using TCP/IP tools

This assessment must change on each assessment occasion. Achievement can be decided by use of a 60% cut-off score.

Where re-assessment is required it should contain a different sample from the range of mandatory content.

#### **Assessment Guidelines**

This assessment can be combined with the assessment(s) for Outcomes 1, 2, 4 and 5. Where an assessment consists of one or more Outcomes, an equal representative set of questions should relate to each Outcome.

It is expected that candidates should be able to complete this assessment in 45 minutes.

## Higher National Unit specification: statement of standards (cont)

**Unit title:** Internet and Network Technology Fundamentals

### Outcome 4

Identify network addressing, components, architectures, topologies and major network operating systems

#### Knowledge and/or Skills

- ◆ Identifying and describing the functions of servers, workstations and hosts
- ◆ Identifying major network operating systems and their respective clients
- ◆ Discussing network packets in relation to the Open Systems Interconnection (OSI) reference model
- ◆ Describing network categories and topologies
- ◆ Describing transmission media and types
- ◆ Describing port numbers and their functions, including well-known and registered port numbers
- ◆ Explaining IP addressing, address classes, default subnet masks and the use of private IP addresses

#### Evidence Requirements

Outcome 4 is a closed-book assessment and should take the form of a set of objective questions. This assessment must be carried out under supervised conditions. Evidence of the Knowledge and/or Skills will be assessed using a representative sample of questions covering the bullet points below:

- ◆ identify and describe the functions of servers, workstations and hosts
- ◆ identify major network operating systems and their respective clients
- ◆ describe network packets in relation to the Open Systems Interconnection (OSI) reference model
- ◆ describe network categories and topologies
- ◆ describe transmission media and types
- ◆ describe port numbers and their functions, including well-known and registered port numbers
- ◆ explain IP addressing, address classes, default subnet masks and the use of private IP addresses

This assessment must change on each assessment occasion. Achievement can be decided by use of a 60% cut-off score.

Where re-assessment is required it should contain a different sample from the range of mandatory content.

#### Assessment Guidelines

This assessment can be combined with the assessment(s) for Outcomes 1, 2, 3 and 5. Where an assessment consists of one or more Outcomes, an equal representative set of questions should relate to each Outcome.

It is expected that candidates should be able to complete this assessment in 45 minutes.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Internet and Network Technology Fundamentals

### **Outcome 5**

Describe the functions of common internetworking server types in relation to Internet protocols

#### **Knowledge and/or Skills**

- ◆ Functions and features of HTTP, proxy, mail, mailing list, DNS, FTP, and other servers
- ◆ Describing how each type of internetworking server uses TCP/IP suite protocols
- ◆ Describing access-security features of an HTTP server, including user names, passwords and file-level access
- ◆ Defining MIME, and explaining how MIME types are used by HTTP and mail servers

#### **Evidence Requirements**

Outcome 5 is a closed-book assessment and should take the form of a set of objective questions. This assessment must be carried out under supervised conditions. Evidence of the Knowledge and/or Skills will be assessed using a representative sample of questions covering the bullet points below:

- ◆ define functions and features of servers eg HTTP, proxy, mail, mailing list, DNS, FTP, and other servers
- ◆ describe how different types of internetworking server uses TCP/IP suite protocols
- ◆ describe access-security features of an HTTP server, including user names, passwords and file-level access
- ◆ define MIME, and explaining how MIME types are used by HTTP and mail servers

This assessment must change on each assessment occasion. Achievement can be decided by use of a 60% cut-off score.

Where re-assessment is required it should contain a different sample from the range of mandatory content.

#### **Assessment Guidelines**

This assessment can be combined with the assessment(s) for Outcomes 1, 2, 3 and 4. Where an assessment consists of one or more Outcomes, an equal representative set of questions should relate to each Outcome.

It is expected that candidates should be able to complete this assessment in 45 minutes.

## Administrative Information

**Unit code:** F204 34

**Unit title:** Internet and Network Technology Fundamentals

**Superclass category:** CE

**Original date of publication:** August 2007

**Version:** 02 (October 2012)

### History of changes:

Version	Description of change	Date
02	Guidance Notes updated to reflect changes in CIW courses.	19/10/12

**Source:** SQA

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## Higher National Unit specification: support notes

### Unit title: Internet and Network Technology Fundamentals

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 is an optional Unit within the HNC Interactive Media award and a mandatory Unit for the PDA (Personal Development Award) Certificate in Web Technologies: Fundamentals at SCQF level 7 (subject to validation). This Unit can be delivered along with the other Unit, HN F203 34 *Web Development Fundamentals*, within the PDA (Personal Development Award) Certificate in Web Technologies: Fundamentals at SCQF level 7 award. It can also be taught as a standalone Unit.

This Unit is designed to introduce candidates to the knowledge and understanding of services, theoretical concepts and principles of Internet technologies. Candidates will be introduced to the configuration and the effective use of popular web client applications (eg browsers, e-mail clients, etc.) in the context of Internet protocols and networking concepts. Other topics include introduction to Internet addressing and common internetworking server types.

The Unit helps prepare candidates to work effectively in today's business environment through the study of how the Internet and its common applications operate from the technical perspective. The purpose of this Unit is not to teach candidates to become network technicians/administrators. The knowledge and skills covered by the Unit form the basis for further study towards various job roles in industries that use the Internet as an integral part of their business eg sales, marketing, web design, web administration, web management, or enterprise development.

Practical exercises including real-world scenarios could be used throughout the course to give candidates sufficient practice and prepare them for assessment. Exercises could involve tasks such as configuring email clients, using e-mail, installing browsers, configuring security settings in a browser, using FTP, SSH and other Internet applications. Labs should be complemented with class discussion about real-world skills applications, and updated topics such as project management and the relationship between technology and business operations. It is beyond the scope of this Unit for candidates to configure DNS servers and to configure and administer networks.

This Unit is part of the PDA Certificate in Web Technologies Fundamentals at SCQF level 7 and maps (at the time of writing) to the Certified Internet Web Professional Internet Business Foundations and Network Technology Foundations module. It also helps prepare candidates for Internet Business Associate 1DO-51A and Network Technology Associate 1DO-51C exams. Candidates who have already achieved these certificates and have provided authentic evidence of these will automatically achieve this Unit.

Details can be found at:

[http://www.ciwcertified.com/certifications/Web\\_Foundations\\_series/iba.php](http://www.ciwcertified.com/certifications/Web_Foundations_series/iba.php)

and

[http://www.ciwcertified.com/certifications/Web\\_Foundations\\_series/nta.php](http://www.ciwcertified.com/certifications/Web_Foundations_series/nta.php)

## **Higher National Unit specification: support notes (cont)**

**Unit title:** Internet and Network Technology Fundamentals

### **Guidance on the delivery and assessment of this Unit**

Each Outcome in this Unit is assessed using a closed-book assessment that takes the form of a set of objective questions covering a representative set of the Knowledge and/or Skills.

Opportunities exist to integrate a number of assessments across this Unit. Assessments, covering different Outcomes, should be integrated at the centre's discretion to suit the abilities of candidates and not create a barrier to achievement. Where an assessment consists of one or more Outcomes, an equal representative set of questions should relate to each Outcome.

Assessment questions can be derived from a short case study which specifies a scenario and several problems. The candidate could then be asked to address the problems with relation to the case study. The case study could be handed out immediately prior to the assessment so that a candidate can read this without taking part of the assessment time.

It is expected that candidates should be able to complete the assessment for each Outcome in 45 minutes. Where an assessment integrates several Outcomes, the time should be adjusted accordingly eg 1.5 hours for 2 Outcomes.

#### ***Opportunities for developing Core Skills***

There are no opportunities to develop Core Skills in this Unit.

### **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).

### **Disabled candidates and/or those with additional support needs**

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website [www.sqa.org.uk/assessmentarrangements](http://www.sqa.org.uk/assessmentarrangements).

## General information for candidates

### Unit title: Internet and Network Technology Fundamentals

This Unit will help to prepare you to work effectively in today's business environment and introduces you essential networking technologies and skills, including TCP/IP, and simple network troubleshooting. You will be introduced to Internet connection methods, Internet protocols and the Domain Name System (DNS). You will study the functions and configuration of web browsers, the components of web addresses, and you will use browsers to download and manage files. On completion of the Unit you should be able to:

- 1 Define networks, the Internet, Internet protocols and the Domain Name System (DNS).
- 2 Configure and use web browsers for secure browsing, web searching, and accessing multimedia.
- 3 Install, configure and troubleshoot e-mail, FTP, and SSH clients.
- 4 Identify network addressing, components, architectures, topologies and major network operating systems.
- 5 Describe the functions of common internetworking server types in relation to Internet protocols.

Topics include fundamental databases concepts as they relate to web search engines, and using search engines to conduct basic and advanced web searches. You will learn about the risks associated with being connected to the Internet, and about the security measures that can keep your computer system and your personal information secure.

The Unit will introduce you to essential networking technologies and protocols that enable users to share data quickly and easily. You will explore the different types of transmission media, and will learn how network architecture and topologies provide for efficient and secure communication. In addition, you be introduced to the OSI reference model and its relationship to packet creation, and compare and contrast the OSI model with the internet architecture model. You will also explore the functions and features of common internetworking server types in relation to Internet protocols.

Throughout the course and depending on the approach to delivery, you may have an opportunity to put many of the above concepts to practical use ranging from installation and configuration of a browser to basic troubleshooting of network connectivity problems.

To complete this Unit successfully, you will have to achieve a satisfactory level of performance. A sample of each Outcome is assessed using set of objective questions presented under closed-book conditions.