

# Certificate and Diplomas in ICT Professional Competence (4520- 01/02/03/04)

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May 2011  
Version 7.0 (February 2017)

Levels 1-4 unit handbook for centres



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# Certificate and Diplomas in ICT Professional Competence (4520-01/02/03/04)

## Levels 1-4 unit handbook for centres

Qualification title	Number	QAN
Level 1 Certificate in ICT Professional Competence	4520-01	501/1671/X
Level 2 Diploma in ICT Professional Competence	4520-02	501/1789/0
Level 3 Diploma in ICT Professional Competence	4520-03	501/1788/9
Level 4 Diploma in ICT Professional Competence	4520-04	501/1787/7

Version and date	Change detail	Section
1.1 Oct 2012	Amendment to the credit value for unit 208	Structure of the units
2.0 Jan 2013	Missing Units 190 & 191 Added	Structure of the units
2.1 March 2013	Amendment to GLH for unit 214 and corrected unit formatting.	Structure of the units
3.0 October 2013	Missing Unit 360 added.	Structure of the units
3.1 January 2014	Correct GLH and credit value of unit 220	Units
3.2 March 2014	Corrected assessment criteria 2.1 in unit 308 to match Ofqual Register	Units
3.3 March 2014	Corrected UAN number for unit 304	Units
4.0 June 2014	Units 501 – 505 units added	Structure of the units
6.0 December 2015	Units 438-451 and 580 added.	Structure of the units
	Unit 288 – assessment method corrected to Portfolio Unit 384 title corrected Unit 416 title corrected Unit 580 credit value corrected to 14	Units
7.0 February 2017	Unit 4520-416 title corrected	



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# 1 Introduction to this units handbook

City & Guilds offers the following qualifications as part of its **ICT Professional Competence** qualification:

<b>Qualification title</b>	<b>Number</b>	<b>QAN</b>
Level 1 Certificate in ICT Professional Competence	4520-01	501/1671/X
Level 2 Diploma in ICT Professional Competence	4520-02	501/1789/0
Level 3 Diploma in ICT Professional Competence	4520-03	501/1788/9
Level 4 Diploma in ICT Professional Competence	4520-04	501/1787/7

This Units handbook contains the units from Levels 1, 2, 3 and 4, which are part of the Level 1 Certificate and Level 2, 3 and 4 Diplomas in ICT Professional Competence.

The Units handbooks should be read in conjunction with the Certificate and Diplomas in ICT Professional Competence (4520) Qualifications handbook for centres, which contains the following important information:

- Introduction to the qualifications
- Centre requirements
- Structure of the qualifications
- Course design and delivery

These handbooks can be downloaded from [www.cityandguilds.com](http://www.cityandguilds.com)

## Structure of the units

The units in these qualifications are written in a standard format and comprise the following:

- City & Guilds unit number
- title
- level
- credit value
- Unit Accreditation Number (UAN)
- unit aim
- statement of guided learning hours
- learning outcomes and assessment criteria
- how the unit is assessed

## Guidance for centres

A glossary (Appendix 1) contains a list of terms that appear in the units.

## Barred combinations

Units that have a significant overlap in content are 'barred combinations'. Learners can take units that are barred and they will appear on the learner's Certificate of Unit Credit (CUC), but barred units will not both/all count towards the credit required for a qualification.

For example, a learner taking Level 2 Diploma will need 39 credits from a choice of optional units. However, if the learner takes unit 213 Level 2 Testing ICT systems (9 credits) and also takes unit 313 Level 3 Testing ICT systems (12 credits), they will accrue only 12 credits from them towards their qualification.

If a centre wishes to claim two (or more) barred units for a learner, they are advised to claim the unit that is most necessary to the rules of combination for the qualification and then wait until they receive the certification before they claim the other barred unit(s).

If a centre claims two (or more) barred units at the same time, they may not be recognised and therefore the learner will not be considered to have achieved the qualification.

**Level:** 1  
**Credit value:** 3  
**UAN:** T/502/4153

## Unit aim

The aim of this unit is to give the learner an introduction to, and help them identify, some of the key uses for Information Technology (IT) and understand when to use particular types of software to aid productivity. The learner will also explore the uses of automated procedures that can be used in software to improve productivity.

Lastly the learner will decide and make recommendations on using different IT tools to perform specific tasks or actions.

## Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Be able to plan the use of appropriate IT systems and software to meet requirements
2. Be able to use IT systems and software efficiently to complete planned tasks
3. Be able to review the selection and use of IT tools to make sure that work activities are successful

## Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

## Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

## How is this unit assessed?

Assessment is by a learner portfolio or using the City & Guilds assignment.

# Unit 4520-100 Improving productivity using IT

## Assessment Criteria

### **Outcome 1 Be able to plan the use of appropriate IT systems and software to meet requirements**

The learner can:

1. Identify the purpose for using IT
2. Identify the methods, skills and resources required to complete the task successfully
3. Plan how to carry out the task using IT to achieve the required purpose and outcome
4. Identify reasons for choosing particular IT systems and software applications for the task
5. Select IT systems and software applications as appropriate for the purpose
6. Identify any legal or local guidelines or constraints that may affect the task or activity

### **Outcome 2 Be able to use IT systems and software efficiently to complete planned tasks**

The learner can:

1. Identify automated routines to improve productivity
2. Use automated routines that aid efficient processing or presentation
3. Complete planned tasks using IT

### **Outcome 3 Be able to review the selection and use of IT tools to make sure that work activities are successful**

The learner can:

1. Review outcomes to make sure they meet the requirements of the task and are fit for purpose
2. Decide whether the IT tools selected were appropriate for the task and purpose
3. Identify the strengths and weaknesses of the completed task
4. Identify ways to make further improvements to work

**Level:** 1  
**Credit value:** 6  
**UAN:** T/500/7157

## Unit aim

The aim of this unit is to introduce some of the key topics that are associated with customer care, whilst understanding any organisational guidelines that determine how customers should be supported. The learner will explore listening techniques and how to verbalise responses to customers. The learner will also explore how to gain authorisation from line managers as well as how and when to escalate a complaint or issue from a customer.

Further to this the learner will also understand their own limitations in providing customer care and how to follow any guidelines and legislation.

## Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Know how to provide customer care in a familiar context
2. Be able to provide customer care in a familiar context

## Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **50** hours should be allocated for this unit.

## Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

## How is this unit assessed?

Assessment is by a learner portfolio or using the City & Guilds assignment.

# Unit 4520-101 Customer care in ICT

## Assessment Criteria

### **Outcome 1 Know how to provide customer care in a familiar context**

The learner can:

1. Describe simple uses of interpersonal communication techniques such as:
  - verbal (eg intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (eg smiling while talking on the phone, body language).
  - attentive listening (ie difference between hearing and listening).
  - positive and negative language.
2. Identify the specified parts of the organisational requirements for customer care including;
  - customer service procedures (eg how to log customer information, how to initiate service calls, how to complete a sale);
  - authorisation procedures (eg how to confirm caller identity, how to validate requests);
  - escalation, resolution and complaint handling;
  - quality assurance procedures;
  - compliance with relevant legislation and regulations (eg data protection, financial services);
  - maintenance and communication of organisational brand or image;
  - organisational aims and objectives
3. Describe the specified methods of measuring customer satisfaction levels such as predefined formal feedback

### **Outcome 2 Be able to provide customer care in a familiar context**

The learner can:

1. Comply with organisational requirements
2. Communicate interpersonally on a familiar subject in a familiar work situation such as:
  - following organisational guidelines and procedures
3. Provide customer interaction such as;
  - focuses on addressing customer needs
  - interacts in a sensitive and helpful manner with the customer.
4. Providing service delivery such as;
  - recognising own limitations;
  - escalating customer issues following organisational requirements
5. Gather specified customer satisfaction information.

**Level:** 1  
**Credit value:** 3  
**UAN:** Y/500/7183

**Unit aim**

The aim of this unit is to support and reinforce any induction training that the learner has carried out. This will be done by requiring the learner to explain their organisation's Health and Safety procedures and how it affects them. They will also be required to identify any sources of information, whether they are online sources from the Health and Safety Executive's website, or posters and signage displayed in the workplace.

Lastly the learners will need to demonstrate how they are following Health and Safety procedures. For example, this could be by demonstrating that they are maintaining a safe working environment, or how they move and handle large and/or heavy objects.

**Learning outcomes**

There is **one** learning outcome to this unit. The learner will:

1. Be able to comply with relevant Health & Safety procedures

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **15** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-102      Health and safety in ICT**

## Assessment Criteria

### **Outcome 1      Be able to comply with relevant Health & Safety procedures**

The learner can:

1. Identify relevant organisational Health & Safety procedures
2. Identify available sources of Health & Safety information
3. Demonstrate how relevant Health & Safety procedures have been followed.

**Level:** 1  
**Credit value:** 3  
**UAN:** M/500/7206

**Unit aim**

The aim of this unit is to introduce to the learner the importance of communicating effectively. This will be done by exploring various techniques both verbal and non verbal. The learner will also explore why it is important to use the correct spelling and grammar in written communications. All of this will be done whilst following any organisational guidelines.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to communicate interpersonally on a familiar subject in a familiar work situation
2. Be able to communicate in writing on familiar subjects using specified formats

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **25** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-103      Interpersonal and written communication**

## Assessment Criteria

### **Outcome 1      Be able to communicate interpersonally on a familiar subject in a familiar work situation**

The learner can:

- 1 Apply knowledge of the following interpersonal communication techniques:
  - verbal (eg intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (eg smiling while talking on the phone, body language).
  - attentive listening (ie difference between hearing and listening).
  - positive and negative language.
- 2 Communicate verbally following organisational guidelines and procedures

### **Outcome 2      Be able to communicate in writing on familiar subjects using specified formats**

The learner can:

- 1 Apply knowledge of the following written communication techniques:
  - Grammar, spelling.
- 2 Use the following techniques to produce and interpret written communication
  - following organisational guidelines and procedures;
  - identifying and conveying key messages in writing (eg letter, fax, email, database notes);
  - using correct grammar and spelling.

**Level:** 1  
**Credit value:** 6  
**UAN:** R/500/7215

**Unit aim**

The aim of this unit is to introduce learners to the concepts of supporting customers remotely with IT requests. This will involve how to identify the validity of the caller and how to handle the caller's support call. The learner should always comply with all legislation and also maintain their organisation's brand and image.

This unit will also introduce the principles of logging support calls and also the time and need for necessary escalation.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know the specified parts of customer care requirements and details of the supported products and services that apply to them
2. Be able to provide routine support on specified products or services

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-106 Remote support for products or services**

## Assessment Criteria

### **Outcome 1 Know the specified parts of customer care requirements and details of the supported products and services that apply to them**

The learner can:

1. Describe specified details of products or services to be supported:
  - how to identify the products or services
  - basic features and uses of the products or services
  - standard responses to frequently asked requests.
2. Describe specified parts of organisational requirements for customer care
  - customer service procedures (eg how to log customer information, how to initiate service calls, how to complete a sale);
  - authorisation procedures (eg how to confirm caller identity, how to validate requests);
  - escalation, resolution and complaint handling;
  - quality assurance procedures;
  - compliance with relevant legislation and regulations (eg data protection, financial services);
  - maintenance and communication of organisational brand or image;
  - organisational aims and objectives.

### **Outcome 2 Be able to provide routine support on specified products or services**

The learner can:

1. Comply with organisational requirements
2. Confirm customer identity and validate requests using specified methods and sources (eg post code, contract list, username)
3. Escalate invalid requests
4. Communicate information on specified products or services to the customer in a positive and professional way, using techniques such as:
  - identifying customers' needs
  - accurately collecting and logging relevant information from the customer
  - providing product and service features to customers
  - ensuring customer understanding of the information provided
5. Resolve and escalate requests.

**Level:** 1  
**Credit value:** 3  
**UAN:** K/500/7219

**Unit aim**

This unit introduces the learner to the threats to IT systems from outside forces, and also introduces the learner to the need to protect their IT systems. The learner will also explore technologies that can be used to secure systems. The learner will also use some of the tools to demonstrate how they can prevent access to IT systems, whilst complying with organisational security policies.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know the particular threats to an IT system and its data with specified methods and procedures for protecting it
2. Be able to comply with relevant security requirements to protect an IT system and its data

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-107 Security of ICT Systems

## Assessment Criteria

### **Outcome 1 Know the particular threats to an IT system and its data with specified methods and procedures for protecting it**

The learner can:

1. Describe specified data protection methods, such as
  - malware detection software (anti-virus, anti spyware etc)
  - Internet security suites (firewall, malware detection, anti-phishing and spam filters)
  - use and protection of passwords or access codes
  - backup and storage.
2. Describe specified methods of providing physical security for ICT systems:
  - access control devices (eg locks, biometric controls, CCTV);
  - limiting visibility of data (eg by positioning of monitors, using encryption);
  - shielding (eg cable screening, Faraday cages)
3. Describe relevant organisational security procedures
4. Describe the type of security breaches that can occur in IT systems, such as
  - unauthorised use of a system without damage to data;
  - unauthorised removal or copying of data or code from a system;
  - damage to or destruction of physical system assets and environment
  - damage to or destruction of data or code inside or outside the system
  - preventing normal use of a system (eg denial of service attack)

### **Outcome 2 Be able to comply with relevant security requirements to protect an IT system and its data**

The learner can:

1. Use specified security tools to identify and prevent breaches of security:
  - internal system tools (eg passwords, anti-virus software, firewalls and encryption facilities)
  - external tools (eg access control devices)
2. Comply with organisational security procedures.

**Level:** 1  
**Credit value:** 6  
**UAN:** D/500/7265

**Unit aim**

The aim of this unit is to introduce the learner to the principles of installing and upgrading software. The learner will explore installing, configuring testing both installations and upgrades to existing systems. The learner will also learn about recording the information needed from installations such as licenses and registration details.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Understand specified parts of the installation/upgrade process
2. Be able to install and upgrade software

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **50** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-108      Software Installation and Upgrade**

## Assessment Criteria

### **Outcome 1      Understand specified parts of the installation/upgrade process**

The learner can:

1. Describe specified installation/upgrade procedures to include:
  - installation
  - configuration
  - testing
  - delivery, shipping and storage;
  - escalation;

### **Outcome 2      Be able to install and upgrade software**

The learner can:

1. Follow specified installation/upgrade procedures
2. Use specified software loading facilities
3. Record information relating to the:
  - software installed/upgraded
  - licences
  - registration
  - installation details
  - configuration
  - testing
  - security and confidentiality

**Level:** 1  
**Credit value:** 6  
**UAN:** H/500/7333

### Unit aim

The aim of this unit is to introduce the learner to IT systems and how to maintain them correctly as well as how to operate them. The learner will explore service levels, how to monitor systems, how to store and dispose of consumables as well as looking at security and confidentiality of data on computer systems.

The learner will also explore how to identify faults and report them correctly, as well as how to minimise faults through the correct operation of information systems.

### Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Know the functionality of specified parts of the system
2. Be able to operate specified parts of the system

### Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **50** hours should be allocated for this unit.

### Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

### How is this unit assessed?

Assessment is by a learner portfolio.

# Unit 4520-109 System operation

## Assessment Criteria

### **Outcome 1 Know the functionality of specified parts of the system**

The learner can:

1. Describe the functionality of specified parts of the system, such as:
  - required service levels (eg availability, quality);
  - routine maintenance;
  - monitoring;
  - data integrity (eg backups, anti-virus);
  - consumables use, storage & disposal;
  - Health & Safety;
  - escalation;
  - information recording and reporting;
  - obtaining work permissions;
  - security & confidentiality.

### **Outcome 2 Be able to operate specified parts of the system**

The learner can:

1. Describe how to operate specified parts of the system, such as:
  - operating parts of the system following specified procedures;
  - identifying and reporting system faults;
  - recording specified operational information;
  - how to recognise system faults.
2. Assess and minimise risks related to your own actions such as.
  - loss or corruption of data;
  - loss of service;
  - damage to equipment.

**Level:** 1  
**Credit value:** 6  
**UAN:** J/500/7342

**Unit aim**

The aim of this unit is to introduce the concepts of providing technical support. The learner will explore current organisational policy regarding to providing technical support. They will also learn how to communicate directly with customers and identify their support needs, also when needed the learner will learn how and when to escalate issues.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know the information relating to the advice and guidance they are required to give and the relevant parts of the organisational policy
2. Be able to provide advice and guidance under direction

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **50** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-110      Technical advice and guidance

## Assessment Criteria

### **Outcome 1      Know the information relating to the advice and guidance they are required to give and the relevant parts of the organisational policy**

The learner can:

1. Describe the relevant parts of organisational policy for providing information
2. Interpret the technical information that forms the basis for required advice and guidance obtained from clearly defined sources

### **Outcome 2      Be able to provide advice and guidance under direction**

The learner can:

1. Identify advice and guidance required by the customer, such as:
  - responding to a direct request, not normally requiring research (eg known problems)
  - requiring minimal interpretation of information
2. Accurately gather specified information from approved sources
3. Communicate by direct contact with the customer according to organisational policies:
  - using approved information
  - with little additional explanation
  - obtaining all relevant information
  - recording the information in a defined format
4. Work within the constraints that the supply of information is subject to
5. Identify and escalate customer requests for information that fall outside of the defined organisational policy or regulatory controls
6. Comply with organisational policy for providing information

**Level:** 1  
**Credit value:** 6  
**UAN:** L/500/7388

**Unit aim**

The aim of this unit is to introduce the learner to diagnosing faults. As part of this the learner will begin to explore some of the diagnostic tools that will be required to perform this role. The learner will also learn how to accurately record information connected with the diagnosis process. The learner will also assist in the diagnosis process as well as learning when and how to escalate an issue.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know the procedures and other information within the diagnostic process that applies to them
2. Be able to assist in the diagnosis of faults following detailed instructions

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-111      Technical fault diagnosis**

## Assessment Criteria

### **Outcome 1      Know the procedures and other information within the diagnostic process that applies to them**

The learner can:

1. Describe relevant parts of the diagnostic process including:
  - diagnostic tools to be used
  - procedures to be followed
  - procedures for information recording individual responsibility and authority escalation procedure
  - technical information about the system to be worked on

### **Outcome 2      Be able to assist in the diagnosis of faults following detailed instructions**

The learner can:

1. Follow detailed instructions to assist with diagnosing faults
2. Use designated diagnostic tools
3. Accurately gather and record specified information connected with the diagnosis

**Level:** 1  
**Credit value:** 6  
**UAN:** T/500/7353

**Unit aim**

The aim of this unit is give the learner the opportunity to learn about the testing of ICT systems whether they be software or hardware systems. In order to do this the learner will need to understand some basic system information, as well as understanding the tests themselves. The learner will learn and understand any health and safety considerations that need to be factored in before and during testing. The learner will also need to understand and consider any security implications associated with the systems they are testing.

The learner will also assist in the testing of an actual system and determine if the tests were successful or not, this will involve using specific tools and accurately recoding results.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know basic technical information about a system to be tested, testing procedures and associated activities, equipment to be used and the reasons for the test
2. Be able to assist testing under direction and record accurately test results

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **50** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-113      Testing ICT systems

## Assessment Criteria

### **Outcome 1      Know basic technical information about a system to be tested, testing procedures and associated activities, equipment to be used and the reasons for the test**

The learner can:

1. Describe relevant parts of the testing process
  - testing tools to be used
  - work procedures to be followed (including obtaining authorisations)
  - procedures for recording information
2. Describe the purposes of testing
  - checking functionality
  - obtaining performance information
3. Describe specified test preparation and conclusion activities, including:
  - Health & safety requirements (before and after)
  - need to obtain work permissions;
  - site access and security
  - environmental legislation and regulations (eg disposal of materials)
  - work sign-off and reporting
  - site restoration
4. Interpret specified technical information about the test and equipment to be tested

### **Outcome 2      Be able to assist testing under direction and record accurately test results**

The learner can:

1. Carry out specified preparation and conclusion activities eg:
  - Health & safety requirements (before and after)
  - need to obtain work permissions;
  - site access and security
  - environmental legislation and regulations (eg disposal of materials)
  - work sign-off and reporting
  - site restoration
2. Use specified testing tools eg:
  - electrical/electronic test instruments
  - on-board self-test programs
  - diagnostic software
3. Record specified test information and test results.

**Level:** 1  
**Credit value:** 6  
**UAN:** H/500/7381

**Unit aim**

The aim of this unit is to introduce the learner to the hardware associated with an ICT system. The learner will explore any regulatory requirements that need to be understood when working with ICT hardware and equipment. The learner will also have the opportunities to use specific tools and techniques to work with computer hardware and systems. All of this will be done whilst following strict guidelines and whilst recording any activities carried out.

**Learning outcome**

There are **two** learning outcomes to this unit. The learner will:

1. Know how to carry out work under direction
2. Be able to carry out work under direction

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-114      Working with ICT hardware and equipment**

## Assessment Criteria

### **Outcome 1      Know how to carry out work under direction**

The learner can:

1. Describe the relevant parts of the working process such as:
  - tools and techniques to be used
  - procedures to be followed
  - procedures for information recording.
2. Explain how regulatory requirements affect own work

### **Outcome 2      Be able to carry out work under direction**

The learner can:

1. Use specified tools and techniques safely
2. Follow specified working procedures such as:
  - Health & Safety;
  - quality
  - use of tools
  - configuration
  - testing; logistics
  - waste disposal
  - problem escalation
  - information recording
  - obtaining work permissions
  - security and confidentiality
3. Record specified information connected with work activities

# Unit 4520-171      Imaging software

**Level:**            1  
**Credit value:**   3  
**UAN:**            J/502/4612

## **Unit aim**

The aim of this unit is to introduce the learner to creating and manipulating images for a given purpose. The learner will explore the purpose of the image to be used or edited, as well as looking at any legislation that restricts the use of images. The learner will also learn about file formats and storing images correctly.

The learner will also use appropriate software to create and edit images using the different tools and techniques within the software application.

## **Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to obtain, insert and combine information for images
2. Be able to use imaging software tools to create, manipulate and edit images

## **Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

## **Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

## **How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-171      Imaging software

## Assessment Criteria

### **Outcome 1      Be able to obtain, insert and combine information for images**

The learner can:

1. Identify what images are needed
2. Obtain, input and prepare images to meet needs
3. Identify what generic copyright and other constraints apply to the use of images
4. Combine information of different types or from different sources for images
5. Identify the context in which the images will be used
6. Identify which file format to use for saving and exchanging images
7. Store and retrieve files effectively, in line with local guidelines and conventions where available

### **Outcome 2      Be able to use imaging software tools to create, manipulate and edit images**

The learner can:

1. Use suitable tools and techniques to create images
2. Use appropriate tools and techniques to manipulate and edit images
3. Check images meet needs, using IT tools and making corrections as necessary

**Level:** 1  
**Credit value:** 3  
**UAN:** H/502/4553

**Unit aim**

The aim of this unit is to introduce some fundamental database concepts. The learner will create a simple database for a given purpose, decide upon its structure and any relationships. The learner will then enter data and perform searches to test the structure of the database using queries. The learner will also learn how to perform reports and generate them using predefined settings.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to enter, edit and organise structured information in a database
2. Be able to use database software tools to extract information and produce reports

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

## **Unit 4520-172      Database software**

### Assessment Criteria

#### **Outcome 1      Be able to enter, edit and organise structured information in a database**

The learner can:

1. Identify the main components of a database
2. Create a database table for a purpose using specified fields
3. Enter structured data into records to meet requirements
4. Locate and amend data records
5. Respond appropriately to data entry error messages
6. Check data meets needs, using IT tools and making corrections as necessary

#### **Outcome 2      Be able to use database software tools to extract information and produce reports**

The learner can:

1. Identify queries which meet information requirements
2. Run simple database queries
3. Identify reports which meet information requirements
4. Generate and print pre-defined database reports

**Level:** 1

**Credit value:** 2

**UAN:** J/502/4299

### **Unit aim**

The aim of this unit is to work with email software. The learner will compose emails, attach files and send emails following guidelines given. The learner will also learn how to stay safe and protect their computer systems when using email software.

The learner will use address book features to simplify the sending process. They will also learn how and when to respond to emails, whilst following organisational guidelines.

### **Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to use email software tools and techniques to compose and send messages
2. Be able to manage incoming email effectively

### **Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **15** hours should be allocated for this unit.

### **Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

### **How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-173      Using email**

## Assessment Criteria

### **Outcome 1      Be able to use email software tools and techniques to compose and send messages**

The learner can:

1. Use software tools to compose and format email messages
2. Attach files to email messages
3. Send email messages
4. Identify how to stay safe and respect others when using email
5. Use an address book to store and retrieve contact information

### **Outcome 2      Be able to manage incoming email effectively**

The learner can:

1. Follow guidelines and procedures for using email
2. Identify when and how to respond to email messages
3. Read and respond to email messages appropriately
4. Identify what messages to delete and when to do so
5. Organise and store email messages
6. Respond appropriately to common email problems

# Unit 4520-174      Using the internet

**Level:**            1  
**Credit value:**    3  
**UAN:**            T/502/4296

## Unit aim

In this unit the learner will explore different ways to connect to the Internet, they will also explore different web browsing systems and modify the browser to suite their needs. The learner will learn how to effectively search the Internet for specified information. They will also use different tools and techniques to communicate via the Internet and exchange and upload information. The learner will learn how to use the Internet safely following any relevant laws and legislation.

## Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Be able to connect to the internet
2. Be able to use browser software to navigate web pages
3. Be able to use browser tools to search for information from the internet
4. Be able to use browser software to communicate information online
5. Be able to follow and understand the need for safety and security practices when working online

## Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

## Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

## How is this unit assessed?

Assessment is by a learner portfolio.

# Unit 4520-174 Using the internet

## Assessment Criteria

### **Outcome 1 Be able to connect to the internet**

The learner can:

1. Identify different types of connection methods that can be used to access the Internet
2. Access the Internet or intranet

### **Outcome 2 Be able to use browser software to navigate web pages**

The learner can:

1. Use browser tools to navigate webpages
2. Identify when to change browser settings to aid navigation
3. Adjust browser settings to meet needs
4. Use browser help facilities

### **Outcome 3 Be able to use browser tools to search for information from the internet**

The learner can:

1. Select and use appropriate search techniques to locate information
2. Outline how information meets requirements
3. Use references to make it easier to find information another time
4. Download and save different types of information from the Internet

### **Outcome 4 Be able to use browser software to communicate information online**

The learner can:

1. Select and use tools and techniques to communicate information online
2. Use browser tools to share information sources with others
3. Submit information online using forms or interactive sites
4. Identify opportunities to post or publish material to websites

### **Outcome 5 Be able to follow and understand the need for safety and security practices when working online**

The learner can:

1. Identify the threats to user safety when working online
2. Outline how to minimise internet security risks
3. Work responsibly and take appropriate safety and security precautions when working online
4. Keep personal information secure
5. Follow relevant laws, guidelines and procedures for the use of the Internet

**Level:** 1  
**Credit value:** 3  
**UAN:** K/502/4621

**Unit aim**

In this unit the learner will learn how to identify information that is required for a presentation. They will also learn to select differing layouts and styles depending on their audience. The learner will look at house styles and how to combine their information into their chosen format ready for a presentation.

The learner will also edit and modify presentations and select appropriate formats in which to present their final presentation.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to input and combine text and other information within presentation slides
2. Be able to use presentation software tools to structure, edit and format slides
3. Be able to prepare slides for presentation to meet needs

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-175      Presentation software

## Assessment Criteria

### **Outcome 1      Be able to input and combine text and other information within presentation slides**

The learner can:

1. Identify what types of information are required for the presentation
2. Select and use different slide layouts as appropriate for different types of information
3. Enter information into presentation slides so that it is ready for editing and formatting
4. Identify any constraints which may affect the presentation
5. Combine information of different forms or from different sources for presentations
6. Store and retrieve presentation files effectively, in line with local guidelines and conventions where available

### **Outcome 2      Be able to use presentation software tools to structure, edit and format slides**

The learner can:

1. Identify what slide structure to use
2. Select and use an appropriate template to structure slides
3. Select and use appropriate techniques to edit slides
4. Select and use appropriate techniques to format slides

### **Outcome 3      Be able to prepare slides for presentation to meet needs**

The learner can:

1. Identify how to present slides to meet needs and communicate effectively
2. Prepare slides for presentation
3. Check presentation meets needs, using IT tools and making corrections as necessary

**Level:** 1**Credit value:** 3**UAN:** A/502/4624**Unit aim**

The aim of this unit is to introduce some of the techniques used in spreadsheets. The learner will identify numerical data that is required to be entered and use specific formulae to manipulate it as required. The learner will also explore how to present data in an appropriate format for end users, such as charts and graphs, as well as formatting the data correctly. The learner will learn how to save and retrieve files correctly.

**Learning outcome**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to use a spreadsheet to enter, edit and organise numerical and other data
2. Be able to use appropriate formulas and tools to summarise and display spreadsheet information
3. Be able to select and use appropriate tools and techniques to present spreadsheet information effectively

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-176 Spreadsheet software

## Assessment Criteria

### **Outcome 1 Be able to use a spreadsheet to enter, edit and organise numerical and other data**

The learner can:

1. Identify what numerical and other information is needed and how the spreadsheet should be structured to meet needs
2. Enter and edit numerical and other data accurately
3. Store and retrieve spreadsheet files effectively, in line with local guidelines and conventions where available

### **Outcome 2 Be able to use appropriate formulas and tools to summarise and display spreadsheet information**

The learner can:

1. Identify how to summarise and display the required information
2. Use functions and formulas to meet calculation requirements
3. Use spreadsheet tools and techniques to summarise and display information

### **Outcome 3 Be able to select and use appropriate tools and techniques to present spreadsheet information effectively**

The learner can:

1. Select and use appropriate tools and techniques to format spreadsheet cells, rows and columns
2. Identify which chart or graph type to use to display information
3. Select and use appropriate tools and techniques to generate, develop and format charts and graphs
4. Select and use appropriate page layout to present and print spreadsheet information
5. Check information meets needs, using spreadsheet tools and making corrections as necessary

**Level:** 1  
**Credit value:** 3  
**UAN:** L/502/4630

**Unit aim**

The aim of this unit is to introduce website development. For this the learner will learn what content is required for the website, and plan how their completed site will look. They will explore images, text and what the intended purpose of the site is to be. The learner will produce a simple website according to their design and incorporate simple navigational aids such as links or buttons. The learner will then upload and test their website.

**Learning outcome**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to plan and create web pages
2. Be able to use website software tools to structure and format web pages
3. Be able to publish web pages to the Internet or an intranet

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-177 Website software

## Assessment Criteria

### **Outcome 1 Be able to plan and create web pages**

The learner can:

1. Identify what content and layout will be needed in the web page
2. Identify the purpose of the webpage and intended audience
3. Select and use a website design template to create a single web page
4. Enter or insert content for web pages so that it is ready for editing and formatting
5. Organise and combine information needed for web pages
6. Identify copyright and other constraints on using others' information
7. Identify what file types to use for saving content
8. Store and retrieve web files effectively, in line with local guidelines and conventions where available

### **Outcome 2 Be able to use website software tools to structure and format web pages**

The learner can:

1. Identify what editing and formatting to use to aid both clarity and navigation
2. Select and use website features to help the user navigate simple websites
3. Use appropriate editing and formatting techniques
4. Check web pages meet needs, using IT tools and making corrections as necessary

### **Outcome 3 Be able to publish web pages to the Internet or an intranet**

The learner can:

1. Upload content to a website
2. Respond appropriately to common problems when testing a web page

**Level:** 1  
**Credit value:** 3  
**UAN:** L/502/4627

**Unit aim**

The aim of this unit is to introduce some of the features and functions of word processing software. The learner will identify the types of information that is to be used within the application and then use the information in various formats to produce differing documents that incorporate a range of tools within the software. This will range from images, tables, forms and templates. The learner will also use differing formatting techniques to enhance their documents, and make them suitable for printing.

**Learning outcome**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to enter, edit and combine text and other information accurately within word processing documents
2. Be able to structure information within word processing documents
3. Be able to use word processing software tools to format and present documents

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-178 Word processing software

## Assessment Criteria

### **Outcome 1 Be able to enter, edit and combine text and other information accurately within word processing documents**

The learner can:

1. Identify what types of information are needed in documents
2. Identify what templates are available and when to use them
3. Use keyboard or other input method to enter or insert text and other information
4. Combine information of different types or from different sources into a document
5. Enter information into existing tables, forms and templates
6. Use editing tools to amend document content
7. Store and retrieve document files effectively, in line with local guidelines and conventions where available

### **Outcome 2 Be able to structure information within word processing documents**

The learner can:

1. Create and modify tables to organise tabular or numeric information
2. Select and apply heading styles to text

### **Outcome 3 Be able to use word processing software tools to format and present documents**

The learner can:

1. Identify what formatting to use to enhance presentation of the document
2. Select and use appropriate techniques to format characters and paragraphs
3. Select and use appropriate page layout to present and print documents
4. Check documents meet needs, using IT tools and making corrections as necessary

**Level:** 1  
**Credit value:** 3  
**UAN:** Y/502/4565

**Unit aim**

The aim of this unit is to introduce some of the principles behind using desktop publishing software. To do this the learner will identify suitable information and use some of the tools and techniques within the application to produce a professional end product. In the process of doing this the learner will also learn about Copyright laws and how they can restrict the production of documents.

**Learning outcome**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to select and use appropriate designs and page layouts for publications
2. Be able to input and combine text and other information within publications
3. Be able to use desktop publishing software techniques to edit and format publications

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-179 Desktop publishing software

## Assessment criteria

### **Outcome 1 Be able to select and use appropriate designs and page layouts for publications**

The learner can:

1. Identify what types of information are needed
2. Identify what page design and layout will be required
3. Select and use an appropriate page design and layout for publications in line with local guidelines, where relevant
4. Select and use appropriate media for the publication

### **Outcome 2 Be able to input and combine text and other information within publications**

The learner can:

1. Input information into publications so that it is ready for editing and formatting
2. Identify copyright constraints on using others' information
3. Organise and combine information of different types or from different sources in line with any copyright constraints
4. Store and retrieve publication files effectively, in line with local guidelines and conventions where available

### **Outcome 3 Be able to use desktop publishing software techniques to edit and format publications**

The learner can:

1. Identify what editing and formatting to use for the publication
2. Select and use appropriate techniques to edit publications and format text
3. Manipulate images and graphic elements accurately
4. Control text flow within single and multiple columns and pages
5. Check publications meet needs, using IT tools and making corrections as necessary

**Level:** 1  
**Credit value:** 3  
**UAN:** M/502/4572

**Unit aim**

The aim of this unit is to introduce the learner to design application software. In order to achieve this, the learner will identify what designs are needed and then decide upon a design layout to meet those needs. The learner will also learn about styles and where to obtain the details that are required to create the designs. The learner will learn how to store and retrieve their designs correctly.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to obtain, insert and combine information for designs
2. Be able to use design software tools to create, manipulate and edit designs

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-180      Design software

## Assessment criteria

### **Outcome 1    Be able to obtain, insert and combine information for designs**

The learner can:

1. Identify what designs are needed
2. Obtain, input and prepare designs to meet needs
3. Identify what generic copyright and other constraints apply to the use of designs
4. Combine information of different types or from different sources for designs
5. Identify the context in which the designs will be used
6. Identify which file format to use for saving and exchanging designs
7. Store and retrieve files effectively, in line with local guidelines and conventions where available

### **Outcome 2    Be able to use design software tools to create, manipulate and edit designs**

The learner can:

1. Use suitable tools and techniques to create designs
2. Use appropriate tools and techniques to manipulate and edit designs
3. Check designs meet needs, using IT tools and making corrections as necessary

**Level:** 1  
**Credit value:** 10  
**UAN:** T/502/8977

**Unit aim**

The aim of this unit is to teach the learner the required subject knowledge to sit the CompTIA Strata Fundamentals of IT Technology exam. The content of the unit covers a broad range of subjects including, the safe use and installation of computer hardware and equipment, looking at the different characteristics of devices such like peripherals. The learner will also look at and learn about compatibility issues that might exist between devices and. Finally, the learner will learn how to recognise hazards and learn how to prevent them.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand computer hardware
2. Understand compatibility issues and common errors
3. Understand health, safety and preventative maintenance

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant CompTIA test.

Assessment criteria

**Outcome 1 Understand computer hardware**

The learner can:

- 1 Demonstrate the proper use of hardware devices
- 2 Explain the characteristics and functions of internal and external storage devices
- 3 Explain the characteristics and functions of peripheral devices
- 4 Explain the characteristics and functions of core input devices

**Outcome 2 Understand compatibility issues and common errors**

The learner can:

- 1 Identify basic compatibility issues between hardware components
- 2 Recognize common operational problems caused by hardware
- 3 Demonstrate the ability to minimize risks

**Outcome 3 Understand health, safety and preventative maintenance**

The learner can:

- 1 Recognize safety hazards and identify corresponding guidelines
- 2 Identify preventative maintenance products, procedures, and how to use them

**Level:** 1  
**Credit value:** 10  
**UAN:** K/502/8975

**Unit aim**

The aim of this unit is to teach the learner the required subject knowledge to sit the CompTIA Strata Fundamentals of PC Functionality exam. The content of this unit covers a broad range of subjects that include learning about; understanding about different IT systems and some of the vocabulary used, learning about some the risks associated with upgrading an IT system, demonstrating how to set up and IT systems. The learner will also learn how to install software, as well as upgrading and removing software; they will explore the functionality of different software tools. Finally, the learner will also learn about security issues that can affect computer systems.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand technology
2. Understand software installation and functions
3. Understand security

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant CompTIA test.

## Assessment criteria

**Outcome 1 Understand technology**

The learner can:

- 1 Identify basic IT vocabulary.
- 2 Identify the risks associated with upgrading the following technologies and equipment.
- 3 Demonstrate the ability to set up a basic PC workstation

**Outcome 2 Understand software installation and functions**

The learner can:

- 1 Conduct basic software installation, removal and/or upgrading.
- 2 Identify issues related to folder and file management
- 3 Explain the function and purpose of software tools

**Outcome 3 Understand security**

The learner can:

- 1 Recognize basic security risks and procedures to prevent them.
- 2 Recognize security breaches and ways to resolve them.
- 3 Recognize IT related laws and guidelines

**Level:** 1

**Credit value:** 3

**NDAQ number:** L/502/4384

### **Unit aim**

The aim of this unit is to give the learner the ability to decide which IT software application is appropriate to use to process different types of data, and to use a range of applications to produce and present information.

### **Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Select and use software applications to meet needs and solve problems
2. Enter, develop and format different types of information to suit its meaning and purpose
3. Present information in ways that are fit for purpose and audience
4. Make effective use of IT tools and facilities to present information

### **Guided learning hours**

It is recommended that **20** hours should be allocated for this unit, although patterns of delivery are likely to vary.

### **Assessment**

This unit will be assessed by:

- an assignment covering practical skills and underpinning knowledge.

# Unit 4520-188 IT Software Fundamentals

## Assessment Criteria

### **Outcome 1 Select and use software applications to meet needs and solve problems**

The learner can:

1. Identify different software applications and give examples of their use
2. Select and use appropriate software applications to develop, produce and present different types of information to meet needs and solve problems
3. Identify what types of information are needed

### **Outcome 2 Enter, develop and format different types of information to suit its meaning and purpose**

The learner can:

1. Enter, organise and format different types of information to meet needs
2. Apply editing techniques to refine information as required
3. Combine information of different forms or from different sources to meet needs
4. Select and use appropriate page layout to present information effectively.

### **Outcome 3 Present information in ways that are fit for purpose and audience**

The learner can:

1. Work accurately and proof-read, using software facilities where appropriate for the task
2. Produce information that is fit for purpose and audience using commonly accepted layouts as appropriate

### **Outcome 4 Make effective use of IT tools and facilities to present information**

The learner can:

1. Review and modify work as it progresses to ensure the result is fit for purpose and audience
2. Review the effectiveness of the IT tools selected to meet presentation needs.

## Unit 4520-190

# Dismantle, assemble, install and maintain a Desktop computing system

**Level:** 1

**Credit value:** 4

**NDAQ number:** H/602/2649

### Unit aim

This unit will enable candidates to identify parts and peripherals of a Personal Computer (PC), dismantle and assemble a PC, install software, and maintain a PC and its peripherals.

### Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to identify parts and peripherals of a PC
2. Be able to dismantle and assemble a PC
3. Be able to install an operating system, drivers and applications on a PC
4. Be able to maintain a PC, peripherals and software

### Guided learning hours

It is recommended that **40** hours should be allocated for this unit, although patterns of delivery are likely to vary.

### Assessment

This unit will be assessed by:

- an assignment covering practical skills and underpinning knowledge.

# **Unit 4520-190      Dismantle, assemble, install and maintain a Desktop computing system**

## Assessment Criteria

### **Outcome 1    Be able to identify parts and peripherals of a PC**

The learner can:

1. Prepare an inventory of equipment/peripherals either available or connected to the PC
2. Create a log of visible ports and internal parts of the PC on the available hardware and map them to cables/plugs/devices they would connect to

### **Outcome 2    Be able to dismantle and assemble a PC**

The learner can:

1. Draw basic diagrams of how ports, cables and plugs are connected together
2. Maintain necessary health & safety precautions, dismantle peripherals and components from the base unit
3. Assemble a PC from a range of available parts
4. Safely check, pack and store ICT equipment
5. Test PC for functionality and where possible rectify any problems

### **Outcome 3    Be able to install an operating system, drivers and applications on a PC**

The learner can:

1. Check compatibility of hardware and minimum system requirements for installation of an operating system (OS)
2. Prepare/configure a system to suit different user requirements
3. Install/update an operating system , driver software for various devices and application software

### **Outcome 4    Be able to maintain a PC, peripherals and software**

The learner can:

1. Maintain different types of computer systems including hardware and software
2. Report/resolve problems encountered using established procedures
3. Create maintenance records following established procedures

**Level: 1****Credit value: 5****NDAQ number: R/602/2646****Unit aim**

This unit will allow candidates the opportunity to enter the PC support environment. Candidates will learn various aspects of computer technology. This will aid the development of skills required for job roles related to PC Support and customer care. Candidates will explore aspects of the technical issues related to home computers as well as business systems.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Identify component functions of a personal computer system
2. Be able to explain Health and Safety and Environmental related issues including disposal of used parts
3. Be able to undertake customer care fundamentals
4. Be able to identify software to protect home and business computers from security issues

**Guided learning hours**

It is recommended that **45** hours should be allocated for this unit, although patterns of delivery are likely to vary.

**Assessment**

This unit will be assessed by:

- an assignment covering practical skills and underpinning knowledge.

# **Unit 4520-191      Fundamentals of computing and customer care**

## Assessment Criteria

### **Outcome 1    Identify component functions of a personal computer system**

The learner can:

1. Identify use of components that make up a PC
2. Connect peripherals for a specific purpose
3. Install an operating system on a personal computer
4. Install a variety of application software on a personal computer

### **Outcome 2    Be able to explain Health and Safety and Environmental related issues including disposal of used parts**

The learner can:

1. use safe handling techniques when dealing with various peripherals including safe lifting, manual handling and anti-static control equipment, packing and unpacking PC components
2. identify the correct type of fire extinguisher for use on an electrical fire
3. give examples of good practices related to COSHH
4. use correct disposal when dealing with unwanted parts of computers
5. identify if the correct mains fuse is fitted to various peripherals

### **Outcome 3    Be able to undertake customer care fundamentals**

The learner can:

1. Identify customer needs and requirements for specific tasks
2. Identify standard customer care situations that should be escalated
3. Communicate effectively with various kinds of customers, including internal customers, using the correct type of questioning
4. Work with others to achieve desired outcomes

### **Outcome 4    Be able to identify software to protect home and business computers from security issues**

The learner can:

1. identify various types of software licence agreements and types
2. carry out software checks to be done before installing software on a customer's PC
3. install, set-up and run various security programs including anti-virus and firewall programs
4. schedule the anti-virus programs to update automatically
5. choose correct back-up media
6. back-up and restore data

**Level:** 2  
**Credit value:** 9  
**UAN:** A/500/7158

**Unit aim**

The aim of this unit is to introduce the concept of providing support to customers, and the techniques to do this correctly. The unit initially focuses on building a relationship of trust with the customer, as well as understanding the implications of customer satisfaction. The unit also looks at complying with any organisational guidelines. The unit will help the learner to understand their own limitations.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know how to provide customer care by establishing customer relationships
2. Be able to provide customer care by establishing customer relationships

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-201 Customer care in ICT

## Assessment Criteria

### **Outcome 1 Know how to provide customer care by establishing customer relationships**

The learner can:

1. Describe the uses of interpersonal communication techniques such as:
  - verbal (eg intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (eg smiling while talking on the phone, body language).
  - attentive listening (ie difference between hearing and listening).
  - positive and negative language.
  - active listening (eg summarising, paraphrasing, body language);
  - listening barriers (eg background noise, distractions, lack of concentration);
  - types of question (eg open, closed and probing)
2. Describe the relevant parts of the organisational requirements for customer care including;
  - customer service procedures (eg how to log customer information, how to initiate service calls, how to complete a sale);
  - authorisation procedures (eg how to confirm caller identity, how to validate requests);
  - escalation, resolution and complaint handling;
  - quality assurance procedures;
  - compliance with relevant legislation and regulations (eg data protection, financial services);
  - maintenance and communication of organisational brand or image;
  - organisational aims and objectives
3. Describe what the implications of customer satisfaction are
  - customer retention;
  - working relationships
4. Describe the relevant methods of measuring customer satisfaction levels such as
  - predefined formal feedback
  - unsolicited feedback;
  - anecdotal feedback

## **Outcome 2 Be able to provide customer care by establishing customer relationships**

The learner can:

1. Comply with organisational requirements
2. Communicate interpersonally on familiar subjects such as:
  - following organisational guidelines and procedures
  - articulating and expressing ideas clearly and concisely
  - listening actively (eg by taking notes)
  - clarifying and confirming understanding (eg by paraphrasing or repetition).
  - responding to questions with accurate information
  - ensuring content is appropriate to the needs of the audience
  - identifying and avoiding listening barriers
  - maintaining focus on the purpose of the communication
3. Providing customer interaction such as;
  - focuses on addressing customer needs
  - interacts in a sensitive and helpful manner with the customer.
  - responds to customer requests on time, accurately, pleasantly and professionally
  - builds a trusting relationship with the customer
  - keeps self and customer focused
  - maintains consistent communication style
4. Provide service delivery such as;
  - recognising own limitations;
  - escalating customer issues following organisational requirements
  - meets own commitments to customers;
  - follows up customer problems and issues
5. Handle complaints from customers such as;
  - using probing questions;
  - displaying patience and understanding with demanding or emotional customers
6. Gather specified customer satisfaction information

**Level:** 2  
**Credit value:** 9  
**UAN:** T/500/7207

**Unit aim**

The aim of this unit is to teach the learner how to communicate effectively both in writing and verbally. The unit will help the learner to understand how to correctly verbalise what needs to be said, by using different tones and intonation. This unit will also help the learner to listen to what people have to say through techniques such as active listening.

This unit will help the learner to effectively communicate in writing by looking at the way they structure their text. The unit will teach them the importance of using the correct grammar and spelling, as well as structuring their texts in certain ways.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to send and receive familiar information by communicating interpersonally in familiar situations
2. Be able to communicate in writing in familiar situations

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-203      Interpersonal and written communication

## Assessment Criteria

### **Outcome 1      Be able to send and receive familiar information by communicating interpersonally in familiar situations**

The learner can:

1. Apply knowledge of the following interpersonal communication techniques:
  - verbal (eg intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (eg smiling while talking on the phone, body language).
  - attentive listening (ie difference between hearing and listening).
  - positive and negative language.
  - active listening (eg summarising, paraphrasing, body language);
  - listening barriers (eg background noise, distractions, lack of concentration);
  - types of question (eg open, closed and probing)
2. Use the following interpersonal communication techniques:
  - modulating voice when speaking to suit the listener or audience
  - articulating and expressing ideas clearly and concisely
  - listening actively (eg by taking notes)
  - clarifying and confirming understanding (eg by paraphrasing or repetition).
  - responding to questions with accurate information
  - ensuring content is appropriate to the needs of the audience
  - identifying and avoiding listening barriers
  - maintaining focus on the purpose of the communication

### **Outcome 2      Be able to communicate in writing in familiar situations**

The learner can:

1. Apply knowledge of the following written communication techniques:
  - Grammar, spelling.
2. Use the following techniques to produce and interpret written communication
  - following organisational guidelines and procedures;
  - identifying and conveying key messages in writing (eg letter, fax, email, database notes);
  - using correct grammar and spelling.
  - using and understanding appropriate business or technical terminology;
  - ensuring content, format and style are appropriate to the audience and channel (eg letter, memo, fax, email, web chat);
  - structuring writing into a logical framework;
  - conveying ideas and information in a clear and concise manner;
  - identifying relevant information in written communications;
  - reviewing or proof reading own written work.

**Level:** 2  
**Credit value:** 6  
**UAN:** Y/601/3317

**Unit aim**

The aim of this unit is encourage the learner to look at themselves through understanding things such as their own development needs, how other people see them and understanding their role in their teams. This unit also teaches the learner about various legislations which govern the way we work in ICT. They are also encouraged to look into professional bodies that are available to people working in this industry.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to develop own personal and professional skills
2. Be able to work as a member of a team to achieve defined goals and implement agreed plans
3. Understand what is meant by professional practice
4. Know the legislative environment relating to IT activities
5. Be able to improve personal effectiveness

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-204      Develop own effectiveness and professionalism**

## Assessment Criteria

### **Outcome 1    Be able to develop own personal and professional skills**

The learner can:

1. obtain and review feedback from others on performance
2. agree personal goals and participate in development activities to meet them

### **Outcome 2    Be able to work as a member of a team to achieve defined goals and implement agreed plans**

The learner can:

1. effectively manage own time
2. recognise and respect diversity, individual differences and perspectives
3. accept and provide feedback in a constructive and considerate manner
4. understand the responsibilities of colleagues
5. identify obstacles to effective teamwork

### **Outcome 3    Understand what is meant by professional practice**

The learner can:

1. Identify the implications, and applicability for IT professionals of:
  - Data Protection Act
  - Computer Misuse Act
2. List the professional bodies for IT

### **Outcome 4    Know the legislative environment relating to IT activities**

The learner can:

1. Identify the impact on an IT organisation of legislation covering:
  - Processing of financial transactions
  - Health and Safety
  - Privacy, Confidentiality and Security
  - Copyright and Intellectual Property Rights

### **Outcome 5    Be able to improve personal effectiveness**

The learner can:

1. List the aims and objectives of the organisation
2. State the organisation's brand or image
3. Identify the organisation's structure, roles and responsibilities
4. Identify potential improvements to working practices

**Level:** 2  
**Credit value:** 6  
**UAN:** J/601/3247

**Unit aim**

The aim of this unit is to introduce the learner to systems development methodologies. Firstly the learner is taught to understand the role of IT systems in our society and understand the need to develop systems. In order to do this the learner will learn the importance of the systems development life cycle.

The learner will also understand the advantages and disadvantages of different types of software options and the importance of quality assurance.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand IT Systems and the roles of IT personnel
2. Understand IT Systems Development Life Cycle (SDLC) models
3. Understand IT Systems Development Life Cycle (SDLC) concepts and processes

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **50** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-205 Introduction to IT systems development

## Assessment Criteria

### **Outcome 1 Understand IT Systems and the roles of IT personnel**

The learner can:

1. Explain the role of IT Systems in society
2. Describe the major components of a contemporary IT System
3. Describe the roles of personnel in the development, operation and use of IT System

### **Outcome 2 Understand IT Systems Development Life Cycle (SDLC) models**

The learner can:

1. Describe top down, bottom up and integrated approaches to IT Systems development
2. Explain the purposes of the initiation, analysis, design and implementation phases of the IT SDLC
3. Identify the advantages and disadvantages of the traditional ('waterfall') SDLC model.
4. Describe two other SDLC models, identifying the type of development for which they are suited

### **Outcome 3 Understand IT Systems Development Life Cycle (SDLC) concepts and processes**

The learner can:

1. Describe the advantages and disadvantages of the following solution types:
  - packaged ('off the shelf')
  - bespoke
  - combination of packaged and bespoke
  - upgrade
2. Explain the importance of quality assurance and meeting customer requirements during the IT SDLC and the means by which they can be achieved
3. Describe the applicability of the following methods of gathering information:
  - interviews
  - observations
  - questionnaires
  - examination of records and documents

**Level:** 2  
**Credit value:** 9  
**UAN:** Y/500/7216

**Unit aim**

The aim of this unit is to introduce some of the concepts of supporting IT systems remotely. The learner will learn which products can be supported and how they can be supported. The learner will also learn the customer care aspects of remote support such as customer service procedures. Whilst doing this the learner will learn how to follow any relevant legislation.

This unit will teach the learner how to provide support and log the support given to users remotely. They will also learn how to extract the information required to make a correct diagnosis.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know relevant parts of customer care requirements and details of the supported products and services
2. Be able to provide support on specified products or services

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-206 Remote support for products and services

## Assessment Criteria

### **Outcome 1 Know relevant parts of customer care requirements and details of the supported products and services**

The learner can:

1. Describe the specified products or services to be supported
  - benefits of the products and services;
  - frequently used product or service options
  - standard features and common uses of the products or services
2. Describe relevant parts of organisational requirements for customer care, such as:
  - customer service procedures (eg how to log customer information, how to initiate service calls, how to complete a sale);
  - authorisation procedures (eg how to confirm caller identity, how to validate requests);
  - escalation, resolution and complaint handling;
  - quality assurance procedures;
  - compliance with relevant legislation and regulations (eg data protection, financial services);
  - maintenance and communication of organisational brand or image;
  - organisational aims and objectives

### **Outcome 2 Be able to provide support on specified products or services**

The learner can:

1. Comply with organisational requirements
2. Confirm customer identity, validate requests and inform customers when authorisation criteria are not met.
3. Communicate information on specified products or services:
  - identifying customers needs
  - accurately collecting and logging relevant information from the customer
  - providing product and service features to customers
  - ensuring customer understanding of the information provided
  - categorising requests and directing customers appropriately
  - managing customer expectations (eg by confirming outcomes, timescales or costs)
4. Make recommendations based on customer needs
5. Resolve and escalate requests and handle basic complaints:
  - using probing questions
  - displaying patience and understanding with demanding or emotional customers

**Level:** 2  
**Credit value:** 9  
**UAN:** D/500/7329

**Unit aim**

The aim of this unit teaches the learner how to install and/or upgrade various pieces of software. The unit also aims to teach the learner how to record information associated with software installations. The learner will learn to install and/or upgrade software from differing locations. As part of this unit the learner will also learn how to follow organisational guidelines and record their actions.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Understand relevant parts of the installation/upgrade process
2. Be able to install/upgrade software

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-208      Software installation and upgrade

## Assessment Criteria

### **Outcome 1      Understand relevant parts of the installation/upgrade process**

The learner can:

1.      Describe the relevant parts of the software installation and upgrade process including:
  - procedures to be followed;
  - procedures for information recording.
  - software storage locations to be used;
  - specifications of the software.
2.      Describe relevant software loading facilities

### **Outcome 2      Be able to install/upgrade software**

The learner can:

1.      Follow relevant installation/upgrade procedures;
2.      Use appropriate software loading facilities;
3.      Record relevant information;
4.      Communicate the progress and outcome of the installation/upgrade to the appropriate people.

**Level:** 2  
**Credit value:** 9  
**UAN:** F/500/7338

**Unit aim**

The aim of this unit is to teach the learner typical ICT operations, in order to do this the unit will teach the learner to identify relevant parts of the operating procedures including monitoring, escalations and obtaining work permissions. This unit will also teach the learner how to use specified parts of IT systems and how to minimise loss through their actions.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know the relevant parts of the operating system
2. Be able to operate specified parts of the system

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-209      ICT system operation

## Assessment Criteria

### **Outcome 1      Know the relevant parts of the operating system**

The learner can:

1. Describe the relevant parts of operating procedures;
  - required service levels (eg availability, quality);
  - routine maintenance;
  - monitoring;
  - data integrity (eg backups, anti-virus);
  - consumables use, storage & disposal;
  - Health & Safety;
  - escalation;
  - information recording and reporting;
  - obtaining work permissions;
  - security & confidentiality.
2. Describe the functionality of relevant parts of the system.

### **Outcome 2      Be able to operate specified parts of the system**

The learner can:

1. Operate specified parts of the system
  - operating specified system parts following procedures;
  - Recognising, resolving or escalating system faults;
  - gathering and recording specified operational information
2. Assess and minimize risks related to your own actions such as.
  - loss or corruption of data;
  - loss of service;
  - damage to equipment

**Level:** 2  
**Credit value:** 9  
**UAN:** F/601/3506

**Unit aim**

The aim of this unit is to teach the learner how to provide technical support. In order to do this the learner will learn how technical advice and guidance can be used and identify the types of information that can aid the user who is being supported. As part of this unit the learner will identify the purposes of IT technical support through providing support to different user types. All of this will be done whilst following organisational guidelines.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know how to provide technical advice and guidance
2. Be able to provide reactive technical advice and guidance to customers on a range of topics

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **50** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-210      Technical advice and guidance

## Assessment Criteria

### **Outcome 1      Know how to provide technical advice and guidance**

The learner can:

1. Identify how technical advice and guidance can be used
2. List the types of information which can form the basis of technical advice and guidance
3. Identify organisational procedures which can apply to the provision of technical advice and guidance
4. Identify circumstances where technical advice and guidance should be provided proactively rather than reactively in response to customer requests (eg to rectify known faults, to provide new functionality).

### **Outcome 2      Be able to provide reactive technical advice and guidance to customers on a range of topics**

The learner can:

1. Identify the purposes for which technical advice and guidance is required
2. Check that customers are entitled to receive the requested technical advice and guidance
3. Communicate effectively with customers to obtain specified information to enable correct technical advice and guidance to be provided
4. Interpret given technical information to produce advice and guidance in response to customer requests
5. Communicate technical advice and guidance to customers in a given format and style, confirming customer understanding of the information provided
6. Follow organisational procedures for responding to customer requests including the timely escalation of those for which technical advice and guidance can not be provided or does not resolve the request

**Level:** 2  
**Credit value:** 9  
**UAN:** T/601/3292

**Unit aim**

The aim of this unit is to teach the learner the process involved in technical fault diagnosis. In order to do this the learner will learn to identify the steps involved in providing a diagnosis including validating the fault and gathering information regarding the fault. The learner will also learn how to use different diagnosing tools. The learner will be taught how to identify and apply remedies to identified faults.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Know the process, methods and information that are used in the diagnostic process
2. Be able to apply processes to diagnose faults with a known range of causes and assist in the diagnosis of other faults
3. Be able to select fault remedies from given alternatives
4. Be able to maintain diagnosis and remedy records

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-211      Technical fault diagnosis

## Assessment Criteria

### **Outcome 1      Know the process, methods and information that are used in the diagnostic process**

The learner can:

1. Identify the steps of the diagnostic process including:
  - fault validation
  - information gathering
  - information analysis
  - solution identification
2. Describe the types of diagnostic information that are commonly needed and their purpose
3. Describe common diagnostic methods to include:
  - substitution
  - replication
  - performance and functional testing
  - environment change
4. List typical considerations affecting fault diagnosis, eg
  - minimisation of service disruption during diagnostics
  - individual responsibility and authority
  - escalation procedure
  - level of service

### **Outcome 2      Be able to apply processes to diagnose faults with a known range of causes and assist in the diagnosis of other faults**

The learner can:

1. Correctly use appropriate diagnostic tools eg
  - electrical/electronic test instruments
  - on-board self-test programs
  - loopback devices
  - on-line/remote monitoring
  - diagnostic software
2. Effectively use given sources of information to support diagnosis.
3. Analyse information to identify the cause of faults, using two of the following approaches:
  - gap analysis
  - identification of cause and effect
  - flow charts

### **Outcome 3 Be able to select fault remedies from given alternatives**

The learner can:

1. Select, from given alternatives, a suitable remedy to rectify identified faults taking into account the following:
  - business or service impact
  - resource and skill availability
  - ease of implementation
2. Identify possible ways to prevent reoccurrence of diagnosed faults

### **Outcome 4 Be able to maintain diagnosis and remedy records**

The learner can:

1. Accurately document the diagnosis activities undertaken including:
  - fault description
  - supporting information
  - diagnostic tools etc used
  - cause of fault
  - remedy selected

# Unit 4520-212      IT project management

**Level:**                2  
**Credit value:**      4  
**UAN:**                T/502/1110

## Unit aim

The aim of this unit is to introduce some of the key aspects involved in project management. In order to do this the learner will learn about the roles and responsibilities of the people involved in project management. The learner will also learn to identify and use some of the documentation used in project management. The learner will be taught how to identify the key criteria that must be satisfied in order to deliver a successful project.

This unit also aims to teach the learner how to collect information that is required during a project and also look at differing lifecycles for project management. Finally, this unit will enable the learner to apply some of the principles and techniques that they have learnt.

## Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to describe Projects and Project Management
2. Be able to demonstrate an understanding of the principles of project management
3. Be able to describe the typical activities within system and project life-cycles
4. Be able to apply the principles of project planning and control

## Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

## Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

## How is this unit assessed?

Assessment is by a learner portfolio.

# Unit 4520-212 IT project management

## Assessment Criteria

### **Outcome 1 Be able to describe Projects and Project Management**

The learner can:

4. Identify 3 different types of project organisation structure
5. Identify key roles and responsibilities within a project's organisation structure ie
  - Sponsor (Executive)
  - Users
  - Suppliers
  - Project Manager
  - Team Manager (Leader)
  - Project Support Office
6. Create key project documentation
  - Project Plan
  - The Business Case
  - The Project Management Plan (PMP)
  - Project Initiation Document (PID)
7. Identify and create the key criteria required in order to deliver a successful project
  - Objectives – Specific Measurable Agreed Realist Time-bound Evaluated Reviewed (SMARTER)
  - Constraints
  - Requirements
8. Calculate the viability of a project using Investment Appraisal techniques
  - Payback period
  - Discounted Cash Flow (DCF) / Net Present Value (NPV)
9. Calculate the Return on investment (ROI) for a given project

### **Outcome 2 Be able to demonstrate an understanding of the principles of project management**

The learner can:

5. Collect and present progress information
6. Create a basic project estimate
7. Tailor the amount of planning effort required for different projects
8. Separate the constraints from the dependencies.

### **Outcome 3 Be able to describe the typical activities within system and project life-cycles**

The learner can:

1. Compare and contrast project and system lifecycles
2. Draw and describe an example of a system lifecycle
3. Obtain an example of a project or system lifecycle
4. Select the correct system development lifecycle for a given situation

## **Outcome 4 Be able to apply the principles of project planning and control**

The learner can:

3. Draw a simple Work Breakdown Structure (WBS)
  - Table Format
  - Diagram Format
4. Draw a simple Product Breakdown Structure (PBS)
5. Produce an Activity on Node (AoN) Network from a list of activities and dependencies
6. Identify the critical path on a basic project network using a given formula
7. Calculate the earliest and latest start and finish dates (ES, EF, LS, LF)
8. Calculate the total float on activities in an AoN Network
9. Construct a Gantt chart from an AoN activity network
10. Represent graphically the resource requirements for a simple project
11. Use control techniques to monitor progress against targets and adjust plans accordingly.

**Level:** 2  
**Credit value:** 9  
**UAN:** A/500/7354

**Unit aim**

The aim of this unit is to introduce the learner to the principles of testing ICT systems. In order to do this the learner will learn how to select relevant tests. Whilst performing these tests the learner will know how to record the outcomes and understand how to follow Service Level Agreements (SLAs). The learner will also learn how to use different types of test depending of the situation and how to interpret the results presented to them.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know technical information about a range of products, testing procedures and associated activities, equipment to be used and the reasons for the test
2. Be able to carry out routine testing and assist in other testing

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-213      Testing ICT systems

## Assessment Criteria

### **Outcome 1      Know technical information about a range of products, testing procedures and associated activities, equipment to be used and the reasons for the test**

The learner can:

1. Describe the testing process to be followed:
  - how to select tests and collect relevant and sufficient information for the test to be successful
  - how to minimise service disruption during testing and avoid detrimental effects or changes to performance
  - ways to configure tests
  - how to record, maintain or restore configurations, data and functionality
  - types of service level agreements
  - individual responsibility and authority
  - escalation procedures and risks associated with using a testing process
2. Describe the purposes of testing eg:
  - aiding the diagnostic process
  - comparing actual and expected performance
3. Describe relevant test preparation and conclusion activities, such as:
  - Health & safety legislation and regulations
  - need to obtain work permissions
  - site access and security
  - system or equipment integrity (eg ensuring network service continuity)
  - data integrity (eg taking data backups before commencing work)
  - resource availability
  - level of service allowed by the SLA
  - environmental legislation and regulations (eg disposal of materials)
  - work sign-off and reporting
  - site restoration .system and equipment integrity (eg restoring service)
  - data integrity (eg restoring data backups as necessary)
3. Interpret technical information on a specified range of products.

## **Outcome 2 Be able to carry out routine testing and assist in other testing**

The learner can:

1. Ensure relevant preparation and conclusion activities have been carried out (see list above)
2. Use appropriate testing tools, such as:
  - electrical/electronic test instruments
  - on-board self-test programs
  - loopback devices
  - on-line/remote monitoring software
  - software debuggers
  - runtime analysers
  - diagnostic software
3. Gather and record relevant test information and test results, including:
  - identifying the relevant information
  - using approved sources of information
  - validating information
4. Respond to test information and results:
  - interpreting error codes/messages
  - comparing with specifications
  - identifying inconsistent data

**Level:** 2  
**Credit value:** 9  
**UAN:** K/500/7382

**Unit aim**

The aim of this unit is to teach the learner how to work effectively with ICT hardware and equipment. The learner will learn which tools might be required, how to plan work and the expectations of customers. The learner will learn about any regulatory requirements that may affect work activities. The learner will have the opportunity to work with ICT hardware and equipment and implement some of the techniques they have learnt, whilst all the time communicating progress and avoiding any disruptions to service.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Know how to plan and carry out a range of ICT hardware and equipment work activities under direction
2. Be able to plan and carry out a range of ICT hardware and equipment work activities under direction
3. Be able to minimise risks related to ICT hardware and equipment work activities

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-214      Working with ICT hardware and equipment**

## Assessment Criteria

### **Outcome 1      Know how to plan and carry out a range of ICT hardware and equipment work activities under direction**

The learner can:

1. Describe the working process such as:
  - tools and techniques to be used;
  - procedures to be followed;
  - procedures for information recording.
  - customer requirements;
  - product specifications
  - planning own work
2. Explain how regulatory requirements affect work activities

### **Outcome 2      Be able to plan and carry out a range of ICT hardware and equipment work activities under direction**

The learner can:

1. Use appropriate tools and techniques safely
2. Follow relevant working procedures such as:
  - Health & Safety
  - quality
  - use of tools
  - configuration
  - testing; logistics
  - waste disposal
  - problem escalation
  - information recording
  - obtaining work permissions
  - security and confidentiality
  - customer acceptance
  - commissioning
  - product registration.
3. Obtain specified resources
4. Record relevant information
5. Communicate the progress and outcome of work to the appropriate people

### **Outcome 3 Be able to minimise risks related to ICT hardware and equipment work activities**

The learner can:

1. Assess and minimise risks related to work activities such as:
  - loss or corruption of data
  - loss of service
  - damage to equipment

**Level:** 2  
**Credit value:** 4  
**UAN:** A/601/3164

**Unit aim**

The aim of this unit is to introduce the learner to computer game development. In order to do this the learner will explore the various hardware and software components that are required in the development of computer games. They will also look at the different features of a range of existing computer games.

The learner will propose a plan for developing a sample game and then move into planning and developing elements of that game.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Know computer game components and the computer games industry
2. Know how to develop a computer game specification
3. Be able to implement a component of a computer game

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **28** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-215 Computer Games Development

## Assessment Criteria

### **Outcome 1 Know computer game components and the computer games industry**

The learner can:

1. Identify the hardware and software components of a video game system
2. Identify the activities required to develop modern computer games
3. Describe the features of an existing computer game

### **Outcome 2 Know how to develop a computer game specification**

The learner can:

1. Contribute to the production of a pre-production proposal document for a computer game project
2. Identify the components required to develop a computer game
3. Contribute to the productions of an implementation plan for a computer game development

### **Outcome 3 Be able to implement a component of a computer game**

The learner can:

1. Design a component of a computer game
2. Develop a component of a computer game

# Unit 4520-216      Data modelling

**Level:**                2  
**Credit value:**      6  
**UAN:**                A/601/3200

## **Unit aim**

The aim of this unit is to introduce some of the concepts behind data modelling. The learner will learn about the basic concepts of data modelling including entities, attributes and relationships. The learner will also learn the objectives of normalisation. The learner will use this knowledge whilst working with a simple database structure.

## **Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know the basic concepts of logical data modelling
2. Be able to use simple data modelling techniques to create logical data models

## **Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

## **Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

## **How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-216 Data modelling

## Assessment Criteria

### **Outcome 1 Know the basic concepts of logical data modelling**

The learner can:

1. Identify entities, attributes and relationships
2. State the objectives of data normalisation
3. State the purpose of keys

### **Outcome 2 Be able to use simple data modelling techniques to create logical data models**

The learner can:

1. Identify and name entities, assigning the correct type and size
2. Identify entity relationships
3. Use a standard notation to create a logical data model

**Level:** 2  
**Credit value:** 6  
**UAN:** Y/500/7331

**Unit aim**

The aim of this unit is to introduce some of the concepts behind managing computer systems. The learner will learn how the configuration of a computer system can affect the management of computer systems. The learner will also learn the importance of asset management. The learner will have an opportunity to use what they have learnt and modify a computer system according to given guidelines.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know how to assist in administering a system
2. Be able to change system configurations

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **55** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-217      System management

## Assessment Criteria

### **Outcome 1      Know how to assist in administering a system**

The learner can:

1. Describe how to use specified system configuration facilities.
2. Explain what ICT asset and configuration information is to be recorded such as:
  - Physical attributes (eg manufacturer, type, revision, serial number, location, value);
  - Configuration (eg physical and logical addresses, options set, connections).

### **Outcome 2      Be able to change system configurations**

The learner can:

1. Make specified changes to system configuration;
2. Gather and record ICT asset and configuration information for specified items.

**Level:** 2  
**Credit value:** 6  
**UAN:** H/500/7378

**Unit aim**

The aim of this unit is to teach the learner how to create and modify user profiles. In order to this the learner will be taught how to create a user identifier and how to work with passwords (and the frequency with which they need to be modified). The learner will also learn the differences between different user types. The learner will have an opportunity to modify existing user account settings.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know how to assist in the administration of user profiles
2. Be able to assist in the administration of user profiles

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **55** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-219      User profile administration

## Assessment Criteria

### **Outcome 1      Know how to assist in the administration of user profiles**

The learner can:

1. Describe how to make changes to user profiles such as:
  - user identifier (eg. username);
  - password and related information (eg change frequency);
  - allowed system access (eg times, locations)
  - allowed access to facilities (eg data, software)

### **Outcome 2      Be able to assist in the administration of user profiles**

The learner can:

1. Make specified changes to user profiles

**Level:** 2  
**Credit value:** 7  
**UAN:** A/601/3181

**Unit aim**

The aim of this unit is to introduce some of the concepts behind object oriented programming. In order to do this the learner will learn some of the key features of an Object Oriented environment. For example, they will learn how to declare structures and use standard input and output commands.

The learner will have an opportunity to use what they have learnt by refining an existing program to improve its quality. Finally, the learner will test the amended program comparing expected with actual results.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to implement software using object oriented programming
2. Be able to refine an object oriented program to improve quality
3. Be able to test the operation of an object oriented driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

# Unit 4520-220      Creating an object oriented computer program using C++

## Assessment Criteria

### Outcome 1      Be able to implement software using object oriented programming

The learner can:

1. Select, declare and initialise variable and data structure types and sizes to meet given requirements
2. Define relationships between objects
3. Implement object behaviours using control structures
4. Declare file structures
5. Use standard input/output commands
6. Use operators and predefined functions
7. Make effective use of an Integrated Development Environment (IDE)

#### Additional guidance:

The learner will be able to

- describe the basic data types char, int, float, char[]
- state the difference between a constant and a variable
- state the difference between a character variable and a character string when using the symbols " " or ' '
- explain the purpose of the null terminator in relation to a character string
- describe a one-dimensional array of type char, int, float
- state the difference between a local and a global variable
- define the components of an object ie data and functions
- explain the methods of using parameters to pass data to a function ie by value, by reference
- describe control structures used for loops ie while, do ... while, for
- describe control structures used for selection ie if, if ... else, switch
- explain the use of stream manipulators
- describe the use of cin and cout for standard input and output and the use of formatters ie endl, \n, \r, \t, \\\, \a, \", \'
- describe the relational operators: < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), == (equal to), != (not equal to)
- describe the logical operators: ! (not), && (and), || (or)
- describe the predefined functions: getch(), cin.getline(), gets(), toupper(), tolower(), atoi(), atof(), strcpy()
- explain the use of the increment (++) and decrement (--) operators in prefix and postfix mode
- describe the arithmetic operators ie \* (multiply), / (divide), - (subtract), + (add), % (modulus)
- state the difference between the assignment operator (=) and the relational operator (==)

## **Outcome 2 Be able to refine an object oriented program to improve quality**

The learner can:

1. Follow an agreed standard for naming, comments and code layout
2. Implement data validation for inputs
3. Implement opportunities error handling and reporting
4. Create on-screen help to assist the users of a computer program

### **Additional guidance:**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for variables and functions and that constants are normally identified using uppercase characters and variables using lowercase characters
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- describe how screen prompts are used to provide information to a user about the actions that can be taken

## **Outcome 3 Be able to test the operation of an object oriented driven program**

The learner can:

1. Use of the debugging facilities available in the IDE
2. Determine expected test results from given test data
3. Compare actual results against expected results to identify discrepancies

### **Additional guidance:**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- state that test data should contain valid and invalid data
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

**Level:** 2  
**Credit value:** 7  
**UAN:** L/601/3167

**Unit aim**

The aim of this unit is to introduce some of the concepts behind procedural programming. As part of this unit the learner will learn some of the key elements of a procedural language such as how to declare file structures and how to use some of the predefined functions. The learner will have an opportunity to use what they have learnt by modifying an existing program to improve its quality. Finally, the learner will test the revised code and record their expected and actual results.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to implement software using procedural programming
2. Be able to refine an object oriented program to improve quality
3. Be able to test the operation of a procedural programme

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

**Outcome 1 Be able to implement software using procedural programming**

The learner can:

1. Select, declare and initialise variable and data structure types and sizes to meet given requirements
2. Implement control structures
3. Declare file structures
4. Use standard input/output commands
5. Use operators and predefined functions
6. Correctly use parameter passing mechanisms

**Additional guidance:**

The learner will be able to

- describe the structure of a program: divisions, sections, paragraphs, sentences and statements
- describe the PICTURE clause required for a given data item: alphanumeric, alphabetic, numeric, numeric edited
- define the relationships between group and elementary data items
- describe the use of literals and figurative constants
- describe how a one-dimensional array can be declared, initialised and accessed
- explain the use of the REDEFINES clause change the definition of a storage area
- describe the operation of the PERFORM statement to execute one or several paragraphs: once, a set number of times, dependent on a condition
- state the purpose of the EXIT statement
- describe control structures used for selection ie IF, IF ... ELSE
- define the terms: character, field, record and file
- explain the meaning of each clause within the SELECT statement in the ENVIRONMENT DIVISION for a sequential file
- state the importance of testing for end of file
- describe how a sequential file can be opened for INPUT, OUTPUT, I-O or EXTEND
- explain the use of FILLER as a data name with the VALUE clause and the figurative constant SPACES to space items across a print line.
- describe the use of the ACCEPT and DISPLAY statements for standard input and output
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), = (equal to), NOT= (not equal to)
- describe the logical operators AND, OR, NOT
- describe the arithmetic operators ie ADD, SUBTRACT, MULTIPLY and DIVIDE
- describe the use, in arithmetic statements, of the following clauses: GIVING, REMAINDER
- describe the effect of using the MOVE statement to move the contents of one data item to another data item of different size (numeric or alphanumeric)

## **Outcome 2 Be able to refine an object oriented program to improve quality**

The learner can:

1. Follow an agreed standard for naming, comments and code layout
2. Implement data validation for inputs
3. Implement opportunities error handling and reporting
4. Create on-screen help to assist the users of a computer program

### **Additional guidance:**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for variables
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- describe the use of ALPHABETIC, NUMERIC, POSITIVE AND NEGATIVE to test the contents of a data item
- state the importance of trapping errors in a program so that the program does not crash at run-time
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken when an error occurs
- state that the purpose of end user documentation is to help the user to operate the software

## **Outcome 3 Be able to test the operation of a procedural programme**

The learner can:

1. Use available debugging tools
2. Determine expected test results from given test data
3. Compare actual results against expected results to identify discrepancies

### **Additional guidance:**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- state that test data should contain valid and invalid data
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

**Level:** 2  
**Credit value:** 7  
**UAN:** T/601/3177

**Unit aim**

The aim of this unit is to introduce some of the concepts behind event driven programming. In order to do this the learner will learn some of the features of an event driven environment such as using standard input and output commands and use the integrated development environment effectively. The learner will also have an opportunity to use what they have learnt by modifying an existing program to improve its quality. Finally, the learner will test their amended code against actual and expected outcomes.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to implement software using event driven programming
2. Be able to refine an event driven program to improve quality
3. Be able to test the operation of an event driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

**Outcome 1 Be able to implement software using event driven programming**

The learner can:

1. Declare and initialise variable and data structure types and sizes to implement given requirements
2. Assign properties to screen components
3. Associate events, including parameter passing, to screen components
4. Implement event handling using control structures
5. Declare file structures
6. Use standard input/output commands to implement design requirements
7. Use of operators and predefined functions
8. Use an Integrated Development Environment (IDE)

**Additional guidance:**

The learner will be able to

- describe how variables of type integer and string are declared and initialised
- describe how a one-dimensional array can be declared, initialised and accessed
- explain how menu bars and menu items are set up using the Menu Editor
- explain how a control can be added to or removed from the toolbox
- describe the use of the following controls and their properties: CheckBox, CommandButton, CommonDialog, Frame, HScrollBar, Image, Label, Line, OptionButton, Shape, TextBox, Timer, VScrollBar
- explain the methods Move, Print and Refresh
- explain the use of shortcut keys in captions, menus and controls
- state how an event is assigned to a control and the types of events that can be assigned ie Change, Click, DblClick,MouseDown,MouseMove,MouseUp,Scroll,Timer
- describe control structures used for selection ie If, If ... Else, Select Case
- describe control structures for loops ie For ... Next, Do While ... Loop, Do ... Loop While
- explain the structure of a sequential file and the methods of access ie Input, Output and Append
- describe the operation of the FreeFile and EOF functions and the Open and Close statements
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), = (equal to), <> (not equal to)
- describe the logical operators AND, OR, NOT
- describe the arithmetic operators ie + (add), - (subtract), \* (multiply), / (divide)
- describe the assignment operator =

## **Outcome 2 Be able to refine an event driven program to improve quality**

The learner can:

1. Follow an agreed standard for naming, comments and code layout
2. Implement data validation for inputs
3. Implement opportunities error handling and reporting
4. Create on-screen help to assist the users of a computer program

### **Additional guidance:**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for forms and controls
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken when an error occurs
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification program listing and test results

## **Outcome 3 Be able to test the operation of an event driven program**

The learner can:

1. Use the debugging facilities available in the IDE
2. Determine expected test results from given test data
3. Compare actual results against expected results to identify discrepancies

### **Additional guidance:**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- state that test data should contain valid and invalid data
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

**Level:** 2  
**Credit value:** 7  
**UAN:** T/601/3177

**Unit aim**

The aim of this unit is to introduce some of the concepts behind event driven programming. In order to do this the learner will learn some of the features of an event driven environment such as using standard input and output commands and use the integrated development environment effectively. The learner will also have an opportunity to use what they have learnt by modifying an existing program to improve its quality. Finally, the learner will test their amended code against actual and expected outcomes.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to implement software using event driven programming
2. Be able to refine an event driven program to improve quality
3. Be able to test the operation of an event driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

**Outcome 1 Be able to implement software using event driven programming**

The learner can:

1. Declare and initialise variable and data structure types and sizes to implement given requirements
2. Assign properties to screen components
3. Associate events, including parameter passing, to screen components
4. Implement event handling using control structures
5. Declare file structures
6. Use standard input/output commands to implement design requirements
7. Use of operators and predefined functions
8. Use an Integrated Development Environment (IDE)

**Additional guidance:**

The learner will be able to

- describe the basic data types int, char, float and boolean
- state the difference between a variable and a constant
- explain the structure of a class, its attributes and methods
- describe how objects are created and manipulated
- explain how a user defined class can be created using extends
- describe how String, Font and Color objects can be manipulated
- explain how to draw lines, shapes and use different fonts and font styles
- describe how a one-dimensional array can be declared, initialised and accessed
- describe the use of packages and the purpose of the import statement
- describe the use of the following controls and their properties: Text field, Label, Text area, Check box, Radio button, Choice, List, Button, Frame, Menu
- state that a Panel is a container used for organising components
- describe how methods are used to manipulate a dialog
- state the difference between a modal and non-modal dialog
- describe how methods are used to manipulate components
- explain how images are loaded, displayed and scaled
- describe control structures used for selection ie if, if ... else, switch
- describe control structures for loops ie for, while, do ... while
- describe applet security (read, write, delete, rename)
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), == (equal to), != (not equal to)
- describe the logical operators && (and), || (or), ! (not)
- describe the arithmetic operators ie + (add), - (subtract), \* (multiply), / (divide)
- describe the assignment operator =
- explain how an applet is created, compiled and executed
- state the difference between a Java application and a Java applet

- explain how a HTML file can be created which contains a reference to a Java applet

## **Outcome 2 Be able to test the operation of an event driven program**

The learner can:

1. Follow an agreed standard for naming, comments and code layout
2. Implement data validation for inputs
3. Implement opportunities error handling and reporting
4. Create on-screen help to assist the users of a computer program

### **Additional guidance:**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for variables and constants
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken when an error occurs
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification program listing and test results

## **Outcome 3 Be able to test the operation of an event driven program**

The learner can:

1. Use the debugging facilities available in the IDE
2. Determine expected test results from given test data
3. Compare actual results against expected results to identify discrepancies

### **Additional guidance:**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- state that test data should contain valid and invalid data
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

**Level:** 2  
**Credit value:** 7  
**UAN:** T/601/3177

**Unit aim**

The aim of this unit is to introduce some of the concepts behind event driven programming. In order to do this the learner will learn some of the features of an event driven environment such as using standard input and output commands and use the integrated development environment effectively. The learner will also have an opportunity to use what they have learnt by modifying an existing program to improve its quality. Finally, the learner will test their amended code against actual and expected outcomes.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to implement software using event driven programming
2. Be able to refine an event driven program to improve quality
3. Be able to test the operation of an event driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

# Unit 4520-224      Creating an event driven computer program using C#

## Assessment Criteria

### Outcome 1      Be able to implement software using event driven programming

The learner can:

1. Declare and initialise variable and data structure types and sizes to implement given requirements
2. Assign properties to screen components
3. Associate events, including parameter passing, to screen components
4. Implement event handling using control structures
5. Declare file structures
6. Use standard input/output commands to implement design requirements
7. Use of operators and predefined functions
8. Use an Integrated Development Environment (IDE)

#### Additional guidance:

The learner will be able to

- describe the basic data types int, bool, char, double, float, long and string
- state the difference between a variable and a constant
- describe how a one-dimensional array can be declared, initialised and accessed
- describe the use of the following controls and their properties: Button, CheckBox, ColorDialog, ComboBox, FontDialog, GroupBox, HScrollBar, Label, ListBox, MenuStrip, OpenFileDialog, PictureBox, RadioButton, RichTextBox, SaveFileDialog, TextBox, Timer, VScrollBar
- state the purpose of the AcceptButton, CancelButton and StartPosition properties of a form
- explain the use of shortcut keys for menus and controls
- describe control structures used for selection ie if, if ... else, switch
- describe control structures for loops ie for, while, do ... while
- describe the structure of a sequential file and the use of the LoadFile and SaveFile methods for a RichTextBox to open and save a file in rtf (Rich Text Format)
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), == (equal to), != (not equal to)
- describe the logical operators && (and), || (or)
- describe the arithmetic operators ie + (add), - (subtract), \* (multiply), / (divide), % (modulus)
- explain the use of the increment (++) and decrement (--) operators in prefix and postfix mode
- describe the assignment operator =

## **Outcome 2 Be able to refine an event driven program to improve quality**

The learner can:

1. Follow an agreed standard for naming, comments and code layout
2. Implement data validation for inputs
3. Implement opportunities error handling and reporting
4. Create on-screen help to assist the users of a computer program

### **Additional guidance:**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for forms, controls, variables and constants
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- explain how try ... catch ... finally can be used to trap errors
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken when an error occurs
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification program listing and test results

## **Outcome 3 Be able to test the operation of an event driven program**

The learner can:

1. Use the debugging facilities available in the IDE
2. Determine expected test results from given test data
3. Compare actual results against expected results to identify discrepancies

### **Additional guidance:**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- state that test data should contain valid and invalid data
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

**Level:** 2  
**Credit value:** 7  
**UAN:** T/601/3177

**Unit aim**

The aim of this unit is to introduce some of the concepts behind event driven programming. In order to do this the learner will learn some of the features of an event driven environment such as using standard input and output commands and use the integrated development environment effectively. The learner will also have an opportunity to use what they have learnt by modifying an existing program to improve its quality. Finally, the learner will test their amended code against actual and expected outcomes.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to implement software using event driven programming
2. Be able to refine an event driven program to improve quality
3. Be able to test the operation of an event driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

**Outcome 1 Be able to implement software using event driven programming**

The learner can:

1. Declare and initialise variable and data structure types and sizes to implement given requirements
2. Assign properties to screen components
3. Associate events, including parameter passing, to screen components
4. Implement event handling using control structures
5. Declare file structures
6. Use standard input/output commands to implement design requirements
7. Use of operators and predefined functions
8. Use an Integrated Development Environment (IDE)

**Additional guidance:**

The learner will be able to

- describe the data types integer, long, string, Boolean
- state the difference between a variable and a constant
- describe how a one-dimensional array can be declared, initialised and accessed
- explain how a control can be added to or removed from the toolbox
- describe the use of the following controls and their properties: CheckBox, Button, ColorDialog, FontDialog, GroupBox, HScrollBar, Label, ListBox, MainMenu, OpenFileDialog, PictureBox, RadioButton, SaveFileDialog, TextBox, Timer, VScrollBar
- explain the use of shortcut keys in menus and controls
- explain the use of a Graphics object and the methods used to draw lines, circles, ellipses and rectangles
- state how an event is assigned to a control and the types of events that can be assigned ie Click, DoubleClick, Load, MouseDown, MouseMove, MouseUp, Scroll, TextChanged, Tick
- describe control structures used for selection ie If, If ... Else, Select Case
- describe control structures for loops ie For ... Next, Do While ... Loop, Do ... Loop While
- explain the structure of a sequential file and the mode of access for reading, writing or appending
- describe the operation of the File.Exists method and the EOF function
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), = (equal to), <> (not equal to)
- describe the logical operators AND, OR, NOT
- describe the arithmetic operators ie + (add), - (subtract), \* (multiply), / (divide), MOD (modulus)
- describe the assignment operator =

## **Outcome 2 Be able to refine an event driven program to improve quality**

The learner can:

1. Follow an agreed standard for naming, comments and code layout
2. Implement data validation for inputs
3. Implement opportunities error handling and reporting
4. Create on-screen help to assist the users of a computer program

### **Additional guidance:**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for forms and controls
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken when an error occurs
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification program listing and test results.

## **Outcome 3 Be able to test the operation of an event driven program**

The learner can:

1. Use the debugging facilities available in the IDE
2. Determine expected test results from given test data
3. Compare actual results against expected results to identify discrepancies

### **Additional guidance:**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- state that test data should contain valid and invalid data
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors.

**Level:** 2  
**Credit value:** 10  
**UAN:** H/602/1386

**Unit aim**

The aim of this unit is provide the underpinning knowledge required for the learner to sit the CompTIA A+ Essentials exam. As part of this unit the learner will learn how personal computer systems operate exploring the different components used. They will also learn the different features and functions of operating systems as well as installing a range of different ones. The learner will learn some networking fundamentals and essential security concepts.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Be able to use personal computer components
2. Understand personal computer troubleshooting, repair and maintenance
3. Understand operating systems
4. Understand basic networking fundamentals
5. Understand security concepts and technology
6. Understand operational considerations when working with personal computers

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant CompTIA test.

# Unit 4520-229      CompTIA A+ Essentials

## Assessment Criteria

### **Outcome 1    Be able to use personal computer components**

The learner can:

1. Categorize storage devices and backup media
2. Explain motherboard components, types and features
3. Classify power supplies types and characteristics
4. Explain the purpose and characteristics of CPUs and their features
5. Explain cooling methods and devices
6. Compare and contrast memory types, characteristics and their purpose
7. Distinguish between the different display devices and their characteristics
8. Install and configure peripherals and input devices
9. Summarize the function and types of adapter cards
10. Install, configure and optimize laptop components and features
11. Install and configure printers

### **Outcome 2    Understand personal computer troubleshooting, repair and maintenance**

The learner can:

1. Explain the troubleshooting theory from a given scenario
2. Explain and interpret common hardware and operating system symptoms and their causes from a given scenario
3. Determine the troubleshooting methods and tools for printers from a given scenario
4. Explain and interpret common laptop issues and determine the appropriate basic troubleshooting method from a given scenario
5. Integrate common preventative maintenance techniques from a given scenario

### **Outcome 3    Understand operating systems**

The learner can:

1. Compare and contrast the different Windows Operating Systems and their features
2. Demonstrate proper use of user interfaces from a given scenario
3. Explain the process and steps to install and configure the Windows Operating System
4. Explain the basics of boot sequences, methods and startup utilities

### **Outcome 4    Understand basic networking fundamentals**

The learner can:

1. Summarize the basics of networking fundamentals, including technologies, devices and Protocols
2. Categorize network cables and connectors and their implementations
3. Compare and contrast the different network types

### **Outcome 5    Understand security concepts and technology**

The learner can:

1. Explain the basic principles of security concepts and technologies
2. Summarize the following security features - Wireless encryption, Malicious software protection, BIOS Security, Password management / password complexity, Locking workstation and Biometrics

## **Outcome 6 Understand operational considerations when working with personal computers**

The learner can:

1. Outline the purpose of appropriate safety and environmental procedures and given a scenario apply them
2. Given a scenario, demonstrate the appropriate use of communication skills and professionalism in the workplace

**Level:** 2  
**Credit value:** 10  
**UAN:** M/602/1388

**Unit aim**

The aim of this unit is provide the underpinning knowledge required for the learner to sit the CompTIA A+ Practical Application exam. As part of that the learner will have a comprehensive understanding of computer hardware. The learner will also understand how operating systems operate looking at a range of differing versions. The learner will be required to learn about networking and security of computer systems.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand hardware
2. Understand Operating Systems (unless otherwise noted, operating systems referred to within include Microsoft Windows 2000, Windows XP Professional, XP Home, XP MediaCenter, Windows Vista Home, Home Premium, Business and Ultimate)
3. Understand networking
4. Understand security

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant CompTIA test.

# Unit 4520-230      CompTIA A+ Practical Application

## Assessment Criteria

### **Outcome 1      Understand hardware**

The learner can:

1. Given a scenario, install, configure and maintain personal computer components
2. Given a scenario, detect problems, troubleshoot and repair/replace personal computer components
3. Given a scenario, install, configure, detect problems, troubleshoot and repair/replace laptop components
4. Given a scenario, select and use the following tools
5. Given a scenario, detect and resolve common printer issues

### **Outcome 2      Understand Operating Systems (unless otherwise noted, operating systems referred to within include Microsoft Windows 2000, Windows XP Professional, XP Home, XP MediaCenter, Windows Vista Home, Home Premium, Business and Ultimate)**

The learner can:

1. Select the appropriate commands and options to troubleshoot and resolve problems
2. Differentiate between Windows Operating System directory structures (Windows 2000, XP and Vista)
3. Given a scenario, select and use system utilities / tools and evaluate the results
4. Evaluate and resolve common issues

### **Outcome 3      Understand networking**

The learner can:

1. Troubleshoot client-side connectivity issues using appropriate tools
2. Install and configure a small office home office (SOHO) network

### **Outcome 4      Understand security**

The learner can:

1. Given a scenario, prevent, troubleshoot and remove viruses and malware
2. Implement security and troubleshoot common issues

**Level:** 2  
**Credit value:** 10  
**UAN:** L/601/7459

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the Cisco IT Essentials Part 1 exam. In order to do that this unit will teach the learner, the principles of differing computer systems. This unit will also teach them how to safely assemble and maintain a range of computer systems and their components. The learner will learn how to maintain an operating system and its built in security components and they will explore and learn the basics of network communication.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand the hardware principles of a computer system
2. Be able to safely assemble and maintain a range of computer systems and their components
3. Be able to maintain operating system and security components
4. Be able to maintain network communication for a computer system

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related course Cisco IT Essentials test (Final for chapter 1-10)

# Unit 4520-232 Cisco IT Essentials Part 1

## Assessment Criteria

### **Outcome 1 Understand the hardware principles of a computer system**

The learner can:

1. Define information technology and describe the components of a personal computer
2. Explain the purpose of preventive maintenance and identify the elements of the troubleshooting process
3. Apply good communication skills and professional behaviour while working with customers

### **Outcome 2 Be able to safely assemble and maintain a range of computer systems and their components**

The learner can:

1. Protect against accidents and injury, protect equipment from damage, protect data from loss, and protect the environment from contamination
2. Perform a step by step assembly of a desk top computer tower
3. Describe, remove, and replace select components of a laptop; upgrade components based on customer needs and perform preventive maintenance and troubleshooting
4. Describe, remove, and replace select components of a printer/ scanner; perform preventive maintenance and troubleshooting

### **Outcome 3 Be able to maintain operating system and security components**

The learner can:

1. Upgrade security components based on customer needs and perform preventive maintenance and troubleshooting
2. Explain, install, and navigate an operating system; upgrade components based on customer needs and perform preventive maintenance and troubleshooting

### **Outcome 4 Be able to maintain network communication for a computer system**

The learner can:

1. Describe and install a network connection; upgrade components based on customer needs and perform preventive maintenance and troubleshooting

**Level:** 2  
**Credit value:** 9  
**UAN:** A/502/1111

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do that the learner will troubleshoot problems in both an attended and unattended windows environment. They will also learn how to upgrade a windows operating system.

The learner will learn how to troubleshoot access to resources such as files and peripheral devices as well as learning to troubleshoot hardware devices and user environments.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to install a Windows Desktop Operating System
2. Be able to manage and troubleshoot Access to Resources
3. Be able to configure and Troubleshoot Hardware Devices and Drivers
4. Be able to configure and troubleshoot the Desktop and User Environments

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by using the relevant Microsoft test.

**Assessment Criteria****Outcome 1 Be able to install a Windows Desktop Operating System**

The learner can:

1. Perform and troubleshoot an attended installation of a Windows XP operating system.
2. Perform and troubleshoot an unattended installation of a Windows desktop operating system.
3. Upgrade from a previous version of Windows.

**Outcome 2 Be able to manage and troubleshoot Access to Resources**

The learner can:

1. Monitor, manage, and troubleshoot access to files and folders
2. Manage and troubleshoot access to shared folders.
3. Connect to local and network print devices.
4. Manage and troubleshoot access to and synchronization of offline files.

**Outcome 3 Be able to configure and Troubleshoot Hardware Devices and Drivers**

The learner can:

1. Configure and troubleshoot storage devices
2. Configure and troubleshoot display devices
3. Configure and troubleshoot Advanced Configuration and Power Interface (ACPI)
4. Configure and troubleshoot I/O devices

**Outcome 4 Be able to configure and troubleshoot the Desktop and User Environments**

The learner can:

1. Configure the user environment
2. Configure support for multiple languages or multiple locations
3. Troubleshoot security settings and local security policy
4. Configure and troubleshoot local user and group accounts
5. Troubleshoot system startup and user logon problems
6. Monitor and analyze system performance

## Unit 4520-238

# Supporting users and troubleshooting desktop applications on a Microsoft Windows XP Operating System

**Level:** 2  
**Credit value:** 9  
**UAN:** F/502/1112

### Unit aim

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do that the learner will learn how to configure and troubleshoot applications, learning to resolve issues around usability and connectivity. The learner will also be asked to customise specific applications.

### Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Be able to configure and troubleshoot applications
2. Be able to resolve Issues Related to Usability
3. Be able to resolve Issues Related to Application Customization
4. Be able to configure and troubleshoot Connectivity for Applications
5. Be able to configure Application Security

### Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

### Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

### How is this unit assessed?

Must be assessed by using the relevant Microsoft test.

**Assessment Criteria****Outcome 1 Be able to configure and troubleshoot applications**

The learner can:

1. Configure and troubleshoot Office applications
2. Configure and troubleshoot Internet Explorer
3. Configure and troubleshoot Outlook Express
4. Configure the operating system to support applications

**Outcome 2 Be able to resolve Issues Related to Usability**

The learner can:

1. Resolve issues related to Office application support features
2. Resolve issues related to Internet Explorer support features
3. Resolve issues related to Outlook Express features
4. Resolve issues related to operating system features

**Outcome 3 Be able to resolve Issues Related to Application Customization**

The learner can:

1. Resolve issues related to customizing an Office application
2. Resolve issues related to customizing Internet Explorer
3. Resolve issues related to customizing Outlook Express
4. Resolve issues related to customizing the operating system to support applications

**Outcome 4 Be able to configure and troubleshoot Connectivity for Applications**

The learner can:

1. Identify and troubleshoot name resolution problems
2. Identify and troubleshoot network adapter configuration problems
3. Identify and troubleshoot LAN and Routing and Remote Access configuration problems
4. Identify and troubleshoot network connectivity problems caused by the firewall configuration
5. Identify and troubleshoot problems with locally attached devices

**Outcome 5 Be able to configure Application Security**

The learner can:

1. Identify and troubleshoot problems related to security permissions
2. Identify and respond to security incidents
3. Manage application security settings

**Level:** 2  
**Credit value:** 9  
**UAN:** J/502/3623

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do that the learner will learn how to install and upgrade Windows Vista. This will involve a clean installation and an upgrade to Windows Vista. The learner will learn to troubleshoot problems with an installation and configure security issues as well as configure a network connection and also configure and maintain applications and systems within Windows Vista. Finally, the learner will learn how to troubleshoot mobile computing devices.

**Learning outcomes**

There are **seven** learning outcomes to this unit. The learner will:

1. Be able to install and upgrade Windows Vista
2. Be able to configure and troubleshoot Post-installation system settings
3. Be able to configure Windows security features
4. Be able to configure network connectivity
5. Be able to configure applications included with Windows Vista
6. Be able to maintain and optimize systems that run Windows Vista
7. Be able to configure and troubleshoot mobile computing

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by using the relevant Microsoft test.

**Assessment Criteria****Outcome 1 Be able to install and upgrade Windows Vista**

The learner can:

1. Identify hardware requirements.
2. Perform a clean installation.
3. Upgrade to Windows Vista from previous versions of Windows.
4. Upgrade from one edition of Windows Vista to another edition.
5. Troubleshoot Windows Vista installation issues, install and configure Windows Vista drivers.

**Outcome 2 Be able to configure and troubleshoot Post-installation system settings**

The learner can:

1. Troubleshoot post-installation configuration issues
2. Configure and troubleshoot Windows Aero
3. Configure and troubleshoot parental controls
4. Configure Microsoft Internet Explorer

**Outcome 3 Be able to configure Windows security features**

The learner can:

1. Configure and troubleshoot User Account Control.
2. Configure Windows Defender
3. Configure Dynamic Security for Microsoft Internet Explorer 7
4. Configure security settings in Windows Firewall

**Outcome 4 Be able to configure network connectivity**

The learner can:

1. Configuring networking by using the Network and Sharing Center
2. Troubleshoot connectivity issues
3. Configure remote access

**Outcome 5 Be able to configure applications included with Windows Vista**

The learner can:

1. Configure and troubleshoot media applications
2. Configure Windows Mail
3. Configure Windows Meeting Space
4. Configure Windows Calendar
5. Configure Windows Fax and Scan
6. Configure Windows Sidebar

## **Outcome 6 Be able to maintain and optimize systems that run Windows Vista**

The learner can:

1. Troubleshoot performance issues
2. Troubleshoot reliability issues by using built-in diagnostic tools
3. Configure Windows Update
4. Configure data protection

## **Outcome 7 Be able to configure and troubleshoot mobile computing**

The learner can:

1. Configure mobile display settings
2. Configure mobile devices
3. Configure Tablet PC software
4. Configure power options

## Unit 4520-240

# Supporting and troubleshooting applications on a Windows Vista client for enterprise support technicians

**Level:** 2  
**Credit value:** 9  
**UAN:** H/502/3628

### Unit aim

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do that the learner will learn how to install Windows Vista from a custom image. The learner will learn to troubleshoot problems with an installation and configure security issues and will also configure a network connection and also configure and maintain applications and systems within Windows Vista. Finally, the learner will learn how to support deployed applications and impose software restrictions.

### Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Be able to deploy Windows Vista
2. Be able to manage Windows Vista Security
3. Be able to manage and Maintain Systems That Run Windows Vista
4. Be able to configure and Troubleshoot Networking
5. Be able to support and maintain Desktop Applications

### Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

### Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

### How is this unit assessed?

Assessment is by a learner portfolio.

**Assessment Criteria****Outcome 1 Be able to deploy Windows Vista**

The learner can:

1. Analyze the business environment and select an appropriate deployment method
2. Prepare a system for clean installation or upgrade
3. Deploy Windows Vista from a custom image
4. Perform post-installation tasks
5. Troubleshoot deployment issues

**Outcome 2 Be able to manage Windows Vista Security**

The learner can:

1. Configure and troubleshoot security for Windows Internet Explorer 7
2. Troubleshoot security configuration issues
3. Troubleshoot Windows Firewall issues
4. Troubleshoot Windows Defender issues
5. Apply security updates
6. Configure and troubleshoot access to resources
7. Troubleshoot authentication issues
8. Configure and troubleshoot User Account Control

**Outcome 3 Be able to manage and Maintain Systems That Run Windows Vista**

The learner can:

1. Troubleshoot policy settings
2. Configure and manage the Task Scheduler
3. Configure and troubleshoot Event Forwarding
4. Apply and troubleshoot updates
5. Troubleshoot performance and reliability issues

**Outcome 4 Be able to configure and Troubleshoot Networking**

The learner can:

1. Configure and troubleshoot network protocols
2. Configure and troubleshoot network services at the client level
3. Configure and troubleshoot remote access
4. Troubleshoot connectivity issues
5. Configure and troubleshoot wireless networking
6. Configure network security
7. Troubleshoot access to network resources

**Outcome 5 Be able to support and maintain Desktop Applications**

The learner can:

1. Support deployed applications
2. Troubleshoot software restrictions
3. Maintain desktop applications

## Unit 4520-241

# Supporting and troubleshooting applications on a Windows Vista client for consumer support technicians

**Level:** 2  
**Credit value:** 9  
**UAN:** K/502/3646

### Unit aim

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do that the learner will learn how to evaluate a potential upgrade environment and install Windows Vista. This will involve a clean installation and an upgrade to Windows Vista. The learner will learn to troubleshoot problems with an installation and configure security issues. The learner will also configure a network connection and also configure and maintain applications and systems within Windows Vista. Finally, the learner will learn to diagnose specified issues and remove malicious software.

### Learning outcomes

There are **six** learning outcomes to this unit. The learner will:

1. Be able to install and upgrade Windows Vista
2. Be able to customize and Configure Settings; Post-Installation:
3. Be able to configure Windows security
4. Be able to configure, troubleshoot, and Repair Networking
5. Be able to install, Configure, and Troubleshoot Devices
6. Be able to troubleshoot and Repair Windows Vista

### Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

### Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

### How is this unit assessed?

Assessment is by a learner portfolio.

**Assessment Criteria****Outcome 1 Be able to install and upgrade Windows Vista**

The learner can:

1. Evaluate potential upgrade environments
2. Prepare to install Windows Vista
3. Troubleshoot and resolve installation issues
4. Troubleshoot and resolve post-installation issues

**Outcome 2 Be able to customize and Configure Settings; Post-Installation:**

The learner can:

1. Configure Sidebar
2. Configure Windows Aero
3. Customize and configure user accounts
4. Evaluate user requirements and recommend, set up, and configure appropriate applications
5. Evaluate user's system and recommend appropriate settings to optimize performance

**Outcome 3 Be able to configure Windows security**

The learner can:

1. Configure Windows Security Centre
2. Configure firewalls
3. Configure Windows updates
4. Configure Windows Defender
5. Configure parental controls
6. Configure Internet Explorer 7
7. Configure user account control
8. Protect data

**Outcome 4 Be able to configure, troubleshoot, and Repair Networking**

The learner can:

1. Configure and troubleshoot network protocols
2. Configure and troubleshoot network services on the client
3. Configure and troubleshoot Windows Vista by using the Network and Sharing Centre
4. Configure and troubleshoot wireless networking, troubleshoot file and print sharing
5. Configure Media Centre

**Outcome 5 Be able to install, Configure, and Troubleshoot Devices**

The learner can:

1. Connect peripherals to Windows Vista
2. Install, configure, and troubleshoot mobile devices
3. Install, configure, and troubleshoot digital cameras and camcorders
4. Install, configure, and troubleshoot media devices
5. Install, configure, and troubleshoot printers, fax machines, and copy devices

## **Outcome 6 Be able to troubleshoot and Repair Windows Vista**

The learner can:

1. Diagnose a specified issue
2. Repair a corrupted operating system
3. Remove malicious software from a client system

## Unit 4520-242

# Deploying and maintaining Windows Vista client and 2007 Microsoft Office System desktops

**Level:** 2  
**Credit value:** 9  
**UAN:** A/502/3649

### Unit aim

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do this the learner will learn to deploy and migrate to Microsoft Office 2010. They will also configure automated installation settings and manage catalogues. The learner will deploy Windows Vista using different methods including Business Desktop Deployment for Microsoft Office 2007. They will also install and configure Application Compatibility Toolkit and manage user state migration.

### Learning outcomes

There are **six** learning outcomes to this unit. The learner will:

1. Be able to deploy the 2007 Microsoft Office System
2. Be able to configure Windows Vista Automated Installation Settings
3. Be able to deploy Windows Vista
4. Be able to use Business Desktop Deployment (BDD) Workbench
5. Be able to use the Application Compatibility Toolkit
6. Be able to manage User State Migration

### Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

### Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

### How is this unit assessed?

Must be assessed by using the relevant Microsoft test.

**Assessment Criteria****Outcome 1 Be able to deploy the 2007 Microsoft Office System**

The learner can:

1. Configure Microsoft Office settings and components.
2. Install the 2007 Microsoft Office system.
3. Migrate from earlier versions of Microsoft Office.

**Outcome 2 Be able to configure Windows Vista Automated Installation Settings**

The learner can:

1. Configure Windows Vista automated installation settings
2. Manage Windows Vista catalogs
3. Add device drivers to Windows Vista installations
4. Manage Windows components
5. Configure and manipulate Windows Imaging Format (WIM) images

**Outcome 3 Be able to deploy Windows Vista**

The learner can:

1. Deploy Windows Vista by using LTI. (Lite Touch Installation)
2. Deploy Windows Vista by using ZTI. (Zero Touch Installation)
3. Customize Windows Pre-installation Environment (PE)
4. Troubleshoot

**Outcome 4 Be able to use Business Desktop Deployment (BDD) Workbench**

The learner can:

1. Install BDD
2. Configure a distribution point in BDD 2007 Workbench
3. Create a reference computer image
4. Manage XML files in BDD Workbench
5. Automate installation of the 2007 Microsoft Office system
6. Customize and maintain Windows PE by using BDD Workbench.

**Outcome 5 Be able to use the Application Compatibility Toolkit**

The learner can:

1. Install and configure Application Compatibility Toolkit (ACT) 5
2. Deploy ACT 5 agents
3. Report application compatibility
4. Fix compatibility issues

## **Outcome 6 Be able to manage User State Migration**

The learner can:

1. Upgrade user state from Windows XP to Windows Vista.
2. Automate user state migration
3. Manage Vista deployments by using SMS 2003
4. Determine OSD prerequisites
5. Install the Microsoft Systems Management (SMS) 2003 Operating System Deployment (OSD) Feature Pack
6. Configure SMS 2003 OSD
7. Troubleshoot
8. Plan

**Level:** 2  
**Credit value:** 6  
**UAN:** Y/601/6797

**Unit aim**

The aim of this unit is to introduce the concepts around installing and configuring Windows 7 user environment. The learner will learn how to deploy and install Windows 7. They will also learn to configure devices and impose restrictions on applications. The learner will also learn how to configure a network and mobile devices, as well and monitor any systems that run Windows 7.

**Learning outcomes**

There are **seven** learning outcomes to this unit. The learner will:

1. Be able to install Upgrade, and Migrate to Windows 7
2. Be able to deploy Windows 7
3. Be able to configure Hardware and Applications
4. Be able to configure Network Connectivity
5. Be able to configure Access to Resources
6. Be able to configure Mobile Computing
7. Be able to monitor and Maintain Systems that Run Windows 7

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **50** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-243      Configuring Windows 7

## Assessment Criteria

### **Outcome 1    Be able to install Upgrade, and Migrate to Windows 7**

The learner can:

- 1.1    Perform a clean installation.
- 1.2    Upgrade to Windows 7 from previous versions of Windows.
- 1.3    Migrate user profiles

### **Outcome 2    Be able to deploy Windows 7**

The learner can:

- 2.1    Capture a system image.
- 2.2    Prepare a system image for deployment.
- 2.3    Deploy a system image.
- 2.4    Configure a VHD

### **Outcome 3    Be able to configure Hardware and Applications**

The learner can:

- 3.1    Configure devices.
- 3.2    Configure application compatibility.
- 3.3    Configure application restrictions.
- 3.4    Configure Internet Explorer.

### **Outcome 4    Be able to configure Network Connectivity**

The learner can:

- 4.1    Configure IPv4 network settings.
- 4.2    Configure IPv6 network settings.
- 4.3    Configure networking settings.
- 4.4    Configure Windows Firewall.
- 4.5    Configure remote management.

### **Outcome 5    Be able to configure Access to Resources**

The learner can:

- 5.1    Configure shared resources.
- 5.2    Configure file and folder access.
- 5.3    Configure user account control (UAC).
- 5.4    Configure authentication and authorization.
- 5.5    Configure BranchCache

### **Outcome 6    Be able to configure Mobile Computing**

The learner can:

- 6.1    Configure BitLocker and BitLocker To Go.
- 6.2    Configure DirectAccess.
- 6.3    Configure mobility options.
- 6.4    Configure remote connections

## **Outcome 7 Be able to monitor and Maintain Systems that Run Windows 7**

The learner can:

- 7.1 Configure updates to Windows 7.
- 7.2 Manage disks.
- 7.3 Monitor systems.
- 7.4 Configure performance settings.

**Level:** 2  
**Credit value:** 10  
**UAN:** M/602/6347

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to that this unit will teach the learner to understand some of the concepts of core programming, as well as understanding different development environments such as Object Oriented and Web Applications. The learner will also learn to understand desktop application and databases.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand Core Programming
2. Understand Object-Oriented Programming
3. Understand General Software Development
4. Understand Web Applications
5. Understand Desktop Applications
6. Understand Databases

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant Microsoft test.

# Unit 4520-252 MTA: software development fundamentals

## Assessment Criteria

### **Outcome 1 Understand Core Programming**

The learner can:

1. Understand computer storage and data types
2. Understand computer decision structures
3. Identify the appropriate method for handling repetition
4. Understand error handling

### **Outcome 2 Understand Object-Oriented Programming**

The learner can:

1. Understand the fundamentals of classes
2. Understand inheritance
3. Understand polymorphism
4. Understand encapsulation

### **Outcome 3 Understand General Software Development**

The learner can:

1. Understand application life cycle management
2. Interpret application specifications
3. Understand algorithms and data structures)

### **Outcome 4 Understand Web Applications**

The learner can:

1. Understand Web page development
2. Understand Microsoft ASP.NET Web application development
3. Understand Web hosting
4. Understand Web services

### **Outcome 5 Understand Desktop Applications**

The learner can:

1. Understand Windows® Forms applications
2. Understand console-based applications
3. Understand Windows Services

### **Outcome 6 Understand Databases**

The learner can:

1. Understand relational database management systems
2. Understand database query methods
3. Understand database connection methods

**Level:** 2  
**Credit value:** 10  
**UAN:** T/602/6348

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to that this unit will teach the learner to understand some of basics of Windows programming, by identifying Windows applications types. The learner will also learn how to use windows forms applications and learn how to deploy a Windows application.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Understand Windows Programming Basics
2. Be able to create Windows Forms applications
3. Be able to create Windows Services applications
4. Be able to access data in a Windows Forms application
5. Be able to deploy a Windows application

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant Microsoft test.

# **Unit 4520-253      MTA: Windows development fundamentals**

## Assessment Criteria

### **Outcome 1    Understand Windows Programming Basics**

The learner can:

1. Identify Windows application types
2. Implement user interface design
3. Create Windows-based applications by using Visual Studio

### **Outcome 2    Be able to create Windows Forms applications**

The learner can:

1. Create and handle events
2. Understand Windows Forms inheritance
3. Understand how to create new controls and extend existing controls
4. Validate and implement user input
5. Debug a Windows-based application

### **Outcome 3    Be able to create Windows Services applications**

The learner can:

1. Create a Windows Services application
2. Install a Windows Services application

### **Outcome 4    Be able to access data in a Windows Forms application**

The learner can:

1. Understand data access methods for a Windows Application
2. Understand databound controls

### **Outcome 5    Be able to deploy a Windows application**

The learner can:

1. Understand Windows application deployment methods
2. Create Windows setup and deployment projects

**Level:** 2  
**Credit value:** 10  
**UAN:** A/602/6349

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do that the learner will learn to understand the importance of security layers and they will learn how to employ operating system security. The learner will also learn to understand network security, and use security software.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand security layers
2. Understand operating system security
3. Understand network security
4. Understand security software

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant Microsoft test.

# **Unit 4520-254      MTA: security development fundamentals**

## Assessment Criteria

### **Outcome 1      Understand security layers**

The learner can:

1. Understand core security principles
2. Understand physical security
3. Understand Internet security
4. Understand wireless security

### **Outcome 2      Understand operating system security**

The learner can:

1. Understand user authentication
2. Understand permissions
3. Understand password policies
4. Understand audit policies
5. Understand encryption
6. Understand malware

### **Outcome 3      Understand network security**

The learner can:

1. Understand dedicated firewalls
2. Understand Network Access Protection (NAP)
3. Understand network isolation
4. Understand protocol security

### **Outcome 4      Understand security software**

The learner can:

1. Understand client protection
2. Understand email protection
3. Understand server protection

**Level:** 2  
**Credit value:** 10  
**UAN:** M/602/6350

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do this the learner will learn about the different network infrastructures that are available including LANs and WANs. They will also understand different networking hardware, as well learning to understand different protocols and services.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand network infrastructures
2. Understand network hardware
3. Understand protocols and services

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant Microsoft test.

# Unit 4520-255 MTA: networking fundamentals

## Assessment Criteria

### **Outcome 1 Understand network infrastructures**

The learner can:

1. Understand the concepts of the Internet, intranet, and extranet
2. Understand local area networks (LANs)
3. Understand wide area networks (WANs)
4. Understand wireless networking
5. Understand network topologies and access methods

### **Outcome 2 Understand network hardware**

The learner can:

1. Understand switches
2. Understand routers
3. Understand media types

### **Outcome 3 Understand protocols and services**

The learner can:

1. Understand the OSI model
2. Understand IPv4
3. Understand IPv6
4. Understand names resolution
5. Understand networking services
6. Understand TCP/IP

**Level:** 2  
**Credit value:** 10  
**UAN:** M/602/6347

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do this the learner will learn to understand some of the fundamentals around the installation of servers, also the roles of different server types. The learner will learn to understand the function of Active Directory, as well as understanding about server storage.

The learner will also learn to understand server management and maintenance.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand server installation
2. Understand server roles
3. Understand active directory
4. Understand storage
5. Understand server performance management
6. Understand server maintenance

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant Microsoft test.

# **Unit 4520-256 MTA: Windows server administration fundamentals**

## Assessment Criteria

### **Outcome 1 Understand server installation**

The learner can:

1. Understand device drivers
2. Understand services
3. Understand server installation options

### **Outcome 2 Understand server roles**

The learner can:

1. Identify application servers
2. Understand Web services
3. Understand remote access
4. Understand file and print services
5. Understand server virtualization

### **Outcome 3 Understand active directory**

The learner can:

1. Understand accounts and groups
2. Understand organizational units (OUs) and containers
3. Understand Active Directory infrastructure
4. Understand group policy

### **Outcome 4 Understand storage**

The learner can:

1. Identify storage technologies
2. Understand RAID
3. Understand disk types

### **Outcome 5 Understand server performance management**

The learner can:

1. Identify major server hardware components
2. Understand performance monitoring
3. Understand logs and alerts

### **Outcome 6 Understand server maintenance**

The learner can:

1. Identify steps in the startup process
2. Understand business continuity
3. Understand updates
4. Understand troubleshooting methodology

**Level:** 2  
**Credit value:** 10  
**UAN:** A/602/6352

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to this the learner will learn to understand some of the concepts of databases, including how data is stored in tables. The learner will learn to understand different database objects and will also learn to manipulate and update data, as well as understanding how to administer a database.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Understand core database concepts
2. Be able to create database objects
3. Be able to manipulate data
4. Understand data storage
5. Be able to administer a database

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant Microsoft test.

# **Unit 4520-257      MTA: database administration fundamentals**

## Assessment Criteria

### **Outcome 1    Understand core database concepts**

The learner can:

1. Understand how data is stored in tables
2. Understand relational database concepts
3. Understand data manipulation language (DML)
4. Understand data definition language (DDL)

### **Outcome 2    Be able to create database objects**

The learner can:

1. Choose data types
2. Understand tables and how to create them
3. Create views
4. Create stored procedures and functions

### **Outcome 3    Be able to manipulate data**

The learner can:

1. Select data
2. Insert data
3. Update data
4. Delete data

### **Outcome 4    Understand data storage**

The learner can:

1. Understand normalization
2. Understand primary, foreign, and composite keys
3. Understand indexes

### **Outcome 5    Be able to administer a database**

The learner can:

1. Understand database security concepts
2. Understand database backups and restore

**Level:** 2  
**Credit value:** 10  
**UAN:** F/602/6353

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the relevant Microsoft exam associated with this unit. In order to do this the learner will learn about different web applications and they will learn to work with data and service.

The learner will also learn to understand how to debug web applications and will learn to work with client side scripting and how to configure the deployment of a web application.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to programme web applications
2. Be able to work with data and services
3. Be able to troubleshoot and debug web applications
4. Be able to work with client-side scripting
5. Be able to configure and deploy web applications

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant Microsoft test.

# Unit 4520-258 MTA: Web development fundamentals

## Assessment Criteria

### **Outcome 1 Be able to programme web applications**

The learner can:

1. Customize the layout and appearance of a Web page
2. Understand ASP.NET intrinsic objects
3. Understand state information in Web applications
4. Understand events and control page flow
5. Understand controls
6. Understand configuration files

### **Outcome 2 Be able to work with data and services**

The learner can:

1. Read and write XML data
2. Distinguish between DataSet objects and DataReader objects
3. Call a service from a Web page
4. Understand DataSource controls
5. Bind controls to data by using data-binding syntax
6. Manage data connections and databases

### **Outcome 3 Be able to troubleshoot and debug web applications**

The learner can:

1. Debug a Web application
2. Handle Web application errors

### **Outcome 4 Be able to work with client-side scripting**

The learner can:

1. Understand client-side scripting.
2. Understand AJAX concepts

### **Outcome 5 Be able to configure and deploy web applications**

The learner can:

1. Configure authentication and authorization
2. Configure projects and solutions and reference assemblies
3. Publish Web applications
4. Understand application pools

## Unit 4520-271      Imaging software

**Level:**                2  
**Credit value:**      4  
**UAN:**                L/502/4613

### **Unit aim**

The aim of this unit is to teach the learner how to use imaging software correctly. In order to do this the learner will describe what images are needed, describe any copyright that effects those images that are going to be used, describe the context with which those images will be used and learn to store them correctly. The learner will also learn to use imaging software and tools by responding to quality problems which may arise.

### **Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to obtain, insert and combine information for images
2. Be able to use imaging software tools to create, manipulate and edit images

### **Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

### **Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

### **How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-271      Imaging software

## Assessment Criteria

### **Outcome 1      Be able to obtain, insert and combine information for images**

The learner can:

1. Describe what images are needed
2. Obtain, input and prepare images to meet needs
3. Describe what copyright and other constraints apply to the use of images
4. Use appropriate techniques to organise and combine information of different types or from different sources
5. Describe the context in which the images will be used
6. Describe what file format to use for saving images to suit different presentation methods
7. Store and retrieve files effectively, in line with local guidelines and conventions where available

### **Outcome 2      Be able to use imaging software tools to create, manipulate and edit images**

The learner can:

1. Identify what technical factors affecting images need to be taken into account and how to do so
2. Select and use suitable techniques to create images
3. Use guide lines and dimensioning tools appropriately to enhance precision
4. Select and use appropriate tools and techniques to manipulate and edit images
5. Check images meet needs, using IT tools and making corrections as necessary
6. Identify and respond to quality problems with images to make sure that they meet needs

**Level:** 2  
**Credit value:** 4  
**UAN:** M/502/4555

**Unit aim**

The aim of this unit is to teach the learner how to use database software effectively. In order to do this the learner will learn to create and modify non-relational database tables, enter, edit and organise structured information. The learner will also produce queries and reports that manipulate the data within a database.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to create and modify non-relational database tables
2. Be able to enter, edit and organise structured information in a database
3. Be able to use database software tools to run queries and produce reports

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

## **Unit 4520-272      Database software**

### Assessment Criteria

#### **Outcome 1      Be able to create and modify non-relational database tables**

The learner can:

1. Identify the components of a database design
2. Describe the field characteristics for the data required
3. Create and modify database tables using a range of field types
4. Describe ways to maintain data integrity
5. Respond appropriately to problems with database tables
6. Use database tools and techniques to ensure data integrity is maintained

#### **Outcome 2      Be able to enter, edit and organise structured information in a database**

The learner can:

1. Create forms to enter, edit and organise data in a database
2. Select and use appropriate tools and techniques to format data entry forms
3. Check data entry meets needs, using IT tools and making corrections as necessary
4. Respond appropriately to data entry errors

#### **Outcome 3      Be able to use database software tools to run queries and produce reports**

The learner can:

1. Create and run database queries using multiple criteria to display or amend selected data
2. Plan and produce database reports from a single table non-relational database
3. Select and use appropriate tools and techniques to format database reports
4. Check reports meet needs, using IT tools and making corrections as necessary

**Level:** 2  
**Credit value:** 3  
**UAN:** M/502/4300

**Unit aim**

The aim of this unit is to teach the learner how to use email software effectively and correctly. In order to do this the learner will learn how to use the tools in an email client to compose and send emails. They will learn how to use the address book feature to aid sending emails and will also learn how to handle and manage incoming emails, for example how to archive emails.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to use email software tools and techniques to compose and send messages
2. Be able to manage incoming email effectively

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-273 Using email

## Assessment Criteria

### **Outcome 1 Be able to use email software tools and techniques to compose and send messages**

The learner can:

1. Select and use software tools to compose and format email messages, including attachments
2. Determine the message size and how it can be reduced
3. Send email messages to individuals and groups
4. Describe how to stay safe and respect others when using email
5. Use an address book to organise contact information

### **Outcome 2 Be able to use email software tools and techniques to compose and send messages**

The learner can:

1. Follow guidelines and procedures for using email
2. Read and respond to email messages appropriately
3. Use email software tools and techniques to automate responses
4. Describe how to archive email messages, including attachments
5. Organise, store and archive email messages effectively
6. Respond appropriately to email problems

# Unit 4520-274      Using the Internet

**Level:**                2  
**Credit value:**      4  
**UAN:**                A/502/4297

## Unit aim

The aim of this unit is to teach the learner how to use the Internet correctly and safely. In order to do this the learner will learn how to connect to the Internet, how to use a web browser effectively and how to improve the performance of a web browser. They will also learn how to search for information on the Internet and learn to use a web browser to communicate information. Finally, the learner will learn how to protect themselves from online threats and understand any laws governing the use of the Internet.

## Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Be able to connect to the Internet
2. Be able to use browser software to navigate webpages effectively
3. Be able to use browser tools to search for information from the Internet
4. Be able to use browser software to communicate information online
5. Understand the need for safety and security practices when working online

## Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

## Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

## How is this unit assessed?

Assessment is by a learner portfolio.

# Unit 4520-274 Using the Internet

## Assessment Criteria

### **Outcome 1 Be able to connect to the Internet**

The learner can:

1. Identify different types of connection methods that can be used to access the Internet
2. Identify the benefits and drawbacks of the connection method used
3. Get online with an Internet connection
4. Use help facilities to solve Internet connection problems

### **Outcome 2 Be able to use browser software to navigate webpages effectively**

The learner can:

1. Select and use browser tools to navigate webpages
2. Identify when to change settings to aid navigation
3. Adjust browser settings to optimise performance and meet needs
4. Identify ways to improve the performance of a browser

### **Outcome 3 Be able to use browser tools to search for information from the Internet**

The learner can:

1. Select and use appropriate search techniques to locate information efficiently
2. Describe how well information meets requirements
3. Manage and use references to make it easier to find information another time
4. Download, organise and store different types of information from the Internet

### **Outcome 4 Be able to use browser software to communicate information online**

The learner can:

1. Identify opportunities to create, post or publish material to websites
2. Select and use appropriate tools and techniques to communicate information online
3. Use browser tools to share information sources with others
4. Submit information online

### **Outcome 5 Understand the need for safety and security practices when working online**

The learner can:

1. Describe the threats to system performance when working online
2. Work responsibly and take appropriate safety and security precautions when working online
3. Describe the threats to information security when working online
4. Manage personal access to online sources securely
5. Describe the threats to user safety when working online
6. Describe how to minimise internet security risks
7. Apply laws, guidelines and procedures for safe and secure Internet use
8. Explain the importance of the relevant laws affecting Internet users

**Level:** 2  
**Credit value:** 4  
**UAN:** M/502/4622

**Unit aim**

The aim of this unit is to teach the learner how to produce presentations properly using presentation software. In order to do this learner will learn how to combine text and other information within presentation slide and they will learn how to enhance their presentations. The learner will also learn how to use some of tools in presentation that aid the structure and edit slide sequences. Finally, the learner will use all that they have learnt to prepare a slideshow for presentation.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to input and combine text and other information within presentation slides
2. Be able to use presentation software tools to structure, edit and format slide sequences
3. Be able to prepare slideshow for presentation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-275      Presentation software

## Assessment Criteria

### **Outcome 1      Be able to input and combine text and other information within presentation slides**

The learner can:

1. Identify what types of information are required for the presentation
2. Enter text and other information using layouts appropriate to type of information
3. Insert charts and tables into presentation slides
4. Insert images, video or sound to enhance the presentation
5. Identify any constraints which may affect the presentation
6. Organise and combine information of different forms or from different sources for presentations
7. Store and retrieve presentation files effectively, in line with local guidelines and conventions where available

### **Outcome 2      Be able to use presentation software tools to structure, edit and format slide sequences**

The learner can:

1. Identify what slide structure and themes to use
2. Select, change and use appropriate templates for slides
3. Select and use appropriate techniques to edit slides and presentations to meet needs
4. Select and use appropriate techniques to format slides and presentations
5. Identify what presentation effects to use to enhance the presentation
6. Select and use animation and transition effects appropriately to enhance slide sequences

### **Outcome 3      Be able to prepare slideshow for presentation**

The learner can:

1. Describe how to present slides to meet needs and communicate effectively
2. Prepare slideshow for presentation
3. Check presentation meets needs, using IT tools and making corrections as necessary
4. Identify and respond to any quality problems with presentations to ensure that presentations meet needs

**Level:** 2  
**Credit value:** 4  
**UAN:** F/502/4625

**Unit aim**

The aim of this unit is to teach the learner how to use Spreadsheet software effectively. In order to do this the learner will learn how to identify which numerical information is needed and how it should be structured and they will learn how to save the data correctly. The learner will also learn how to correctly use the formula and analysis tools to meet the given requirements. Finally, the learner will learn how to present their findings to meet the audience's requirements.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to use a spreadsheet to enter, edit and organise numerical and other data
2. Be able to select and use appropriate formulas and data analysis tools to meet requirements
3. Be able to select and use tools and techniques to present and format spreadsheet information

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-276 Spreadsheet software

## Assessment Criteria

### **Outcome 1 Be able to use a spreadsheet to enter, edit and organise numerical and other data**

The learner can:

1. Identify what numerical and other information is needed in the spreadsheet and how it should be structured
2. Enter and edit numerical and other data accurately
3. Combine and link data across worksheets
4. Store and retrieve spreadsheet files effectively, in line with local guidelines and conventions where available

### **Outcome 2 Be able to select and use appropriate formulas and data analysis tools to meet requirements**

The learner can:

1. Identify which tools and techniques to use to analyse and manipulate data to meet requirements
2. Select and use a range of appropriate functions and formulas to meet calculation requirements
3. Use a range of tools and techniques to analyse and manipulate data to meet requirements

### **Outcome 3 Be able to select and use tools and techniques to present and format spreadsheet information**

The learner can:

1. Plan how to present and format spreadsheet information effectively to meet needs
2. Select and use appropriate tools and techniques to format spreadsheet cells, rows, columns and worksheets
3. Select and format an appropriate chart or graph type to display selected information
4. Select and use appropriate page layout to present and print spreadsheet information
5. Check information meets needs, using spreadsheet tools and making corrections as necessary
6. Describe how to find errors in spreadsheet formulas
7. Respond appropriately to any problems with spreadsheets

**Level:** 2  
**Credit value:** 4  
**UAN:** R/502/4631

**Unit aim**

The aim of this unit is to teach the learner how to produce effective websites using website software. In order to do this the learner will describe the content and layout of the website that will be produced, they will also describe any copyright issues related to the content of the website. The learner will learn to use software to create their designs by using its features correctly and they will learn how to correctly publish their website/s.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to create structures and styles for websites
2. Be able to use website software tools to prepare content for websites
3. Be able to publish websites

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-277 Website software

## Assessment Criteria

### **Outcome 1 Be able to create structures and styles for websites**

The learner can:

1. Describe what website content and layout will be needed for each page
2. Plan and create web page templates to layout
3. Select and use website features and structures to help the user navigate round web pages within the site
4. Create, select and use styles to keep the appearance of web pages consistent and make them easy to understand
5. Describe how copyright and other constraints may affect the website
6. Describe what access issues may need to be taken into account
7. Describe what file types to use for saving content
8. Store and retrieve files effectively, in line with local guidelines and conventions where available

### **Outcome 2 Be able to use website software tools to prepare content for websites**

The learner can:

1. Prepare content for web pages so that it is ready for editing and formatting
2. Organise and combine information needed for web pages including across different software
3. Select and use appropriate editing and formatting techniques to aid both clarity and navigation
4. Select and use appropriate development techniques to link information across pages
5. Change the file formats appropriately for content
6. Check web pages meet needs, using IT tools and making corrections as necessary

### **Outcome 3 Be able to publish websites**

The learner can:

1. Select and use appropriate testing methods to check that all elements of websites are working as planned
2. Identify any quality problems with websites and how to respond to them
3. Select and use an appropriate programme to upload and publish the website
4. Respond appropriately to problems with multiple page websites

**Level:** 2  
**Credit value:** 4  
**UAN:** R/502/4628

**Unit aim**

The aim of this unit is to teach the learner how to use word processing software correctly and effectively. In order to do this the learner will learn how to enter and combine text accurately within word processing documents. They will learn to use a range a range tools and features within he application and will also learn how create and modify the structure of a document using different styles. Finally, the learner will learn to produce documents that meet the requirements of the intended audiences.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to enter and combine text and other information accurately within word processing documents
2. Be able to create and modify layout and structures for word processing documents
3. Be able to use word processing software tools to format and present documents effectively to meet requirements

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-278      Word processing software

## Assessment Criteria

### **Outcome 1      Be able to enter and combine text and other information accurately within word processing documents**

The learner can:

1. Identify what types of information are needed in documents
2. Use appropriate techniques to enter text and other information accurately and efficiently
3. Select and use appropriate templates for different purposes
4. Identify when and how to combine and merge information from other software or other documents
5. Select and use a range of editing tools to amend document content
6. Combine or merge information within a document from a range of sources
7. Store and retrieve document and template files effectively, in line with local guidelines and conventions where available

### **Outcome 2      Be able to create and modify layout and structures for word processing documents**

The learner can:

1. Identify the document requirements for structure and style
2. Identify what templates and styles are available and when to use them
3. Create and modify columns, tables and forms to organise information
4. Select and apply styles to text

### **Outcome 3      Be able to use word processing software tools to format and present documents effectively to meet requirements**

The learner can:

1. Identify how the document should be formatted to aid meaning
2. Select and use appropriate techniques to format characters and paragraphs
3. Select and use appropriate page and section layouts to present and print documents
4. Describe any quality problems with documents
5. Check documents meet needs, using IT tools and making corrections as necessary
6. Respond appropriately to quality problems with documents so that outcomes meet needs

**Level:** 2  
**Credit value:** 4  
**UAN:** D/502/4566

**Unit aim**

The aim of this unit is to teach the learner to produce effective publications using desktop publishing software. In order to do this the learner will describe the information they will use to produce a document and they will also learn to combine their text with other information to produce professional presentations. Finally, the learner will use what they have learnt to produce and edit a publication.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to select and use appropriate designs and page layouts for publications
2. Be able to input and combine text and other information within publications
3. Be able to use desktop publishing software techniques to edit and format publications

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-279 Desktop publishing software

## Assessment Criteria

### **Outcome 1 Be able to select and use appropriate designs and page layouts for publications**

The learner can:

1. Describe what types of information are needed
2. Describe how to change page design and layout to increase effectiveness of a publication
3. Select, change and use an appropriate page design and layout for publications in line with local guidelines, where relevant
4. Select and use appropriate media for the publication

### **Outcome 2 Be able to input and combine text and other information within publications**

The learner can:

1. Find and input information into a publication so that it is ready for editing and formatting
2. Organise and combine information for publications in line with any copyright constraints, including importing information produced using other software
3. Describe how copyright constraints affect use of own and others' information
4. Describe which file format to use for saving designs and images
5. Store and retrieve publication files effectively, in line with local guidelines and conventions where available

### **Outcome 3 Be able to use desktop publishing software techniques to edit and format publications**

The learner can:

1. Identify what editing and formatting to use for the publication
2. Select and use appropriate techniques to edit publications and format text
3. Manipulate images and graphic elements accurately
4. Control text flow within single and multiple columns and pages
5. Check publications meet needs, using IT tools and making corrections as necessary
6. Identify and respond to quality problems with publications to make sure they meet needs

**Level:** 2  
**Credit value:** 4  
**UAN:** T/502/4573

**Unit aim**

The aim of this unit is to teach the learner to use design software to produce professional designs. To do this the learner will describe what designs are needed and describe what copyrights and constraints apply to their designs. The learner will also use design software to create, manipulate and edit designs as well as being able to identify and respond to quality problems with designs.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to obtain, insert and combine information for designs
2. Be able to use design software tools to create, manipulate and edit designs

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-280      Design software

## Assessment Criteria

### **Outcome 1      Be able to obtain, insert and combine information for designs**

The learner can:

1. Describe what designs are needed
2. Obtain, input and prepare designs to meet needs
3. Describe what copyright and other constraints apply to the use of designs
4. Use appropriate techniques to organise and combine information of different types or from different sources
5. Describe the context in which the designs will be used
6. Describe what file format to use for saving designs to suit different presentation methods
7. Store and retrieve files effectively, in line with local guidelines and conventions where available

### **Outcome 2      Be able to use design software tools to create, manipulate and edit designs**

The learner can:

1. Identify what technical factors affecting designs need to be taken into account and how to do so
2. Select and use suitable techniques to create designs
3. Use guide lines and dimensioning tools appropriately to enhance precision
4. Select and use appropriate tools and techniques to manipulate and edit for designs
5. Check designs meet needs, using IT tools and making corrections as necessary
6. Identify and respond to quality problems with designs to make sure that they meet needs

**Level:** 2  
**Credit value:** 10  
**UAN:** T/502/8980

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the appropriate exam for this unit. In order to do this the learner will be able to support a virtual business, by defining a target market and support a start-up business. The learner will also learn to support an IP system for a virtual business.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to support a virtual business
2. Be able to support an IP based system for a virtual

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by the related course activities

# Unit 4520-281 Cisco Passport21 Aspire fundamentals

## Assessment Criteria

### **Outcome 1 Be able to support a virtual business**

The learner can:

1. Select a business strategy based on personal objectives
2. Identify a range products and services to offer to customers
3. Define target market
4. Investigate different types of advertising media
5. Select Internet service provider based on requirements
6. Implement budgeting decisions based on social criteria
7. Support the start-up of a business
8. Support a business during changing business conditions
9. Support customer expectations
10. Support business resources

### **Outcome 2 Be able to support an IP based system for a virtual**

The learner can:

1. Identify application layer protocols
2. Implement a virtual Ethernet network
3. Implement IP addresses
4. Implement a virtual wireless network
5. Support virtual wireless network security
6. Test and troubleshoot virtual wireless issues
7. Test and troubleshoot virtual default gateway settings
8. Test and troubleshoot classed network subnet mask settings
9. Identify virtual collision and broadcast domains
10. Test and troubleshoot virtual network client configurations
11. Select correct switch or router requirements
12. Upgrade a virtual switch or router
13. Implement a multiple network configuration
14. Implement a virtual interior routing protocol
15. Test and troubleshoot virtual network connectivity
16. Test and troubleshoot subnet mask errors
17. Plan and Support the subnetting of a network

**Level:** 2  
**Credit value:** 8  
**UAN:** D/601/6798

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the appropriate exam for this unit. In order to do this the learner will be able to identify the causes of and resolving issues in desktop applications and networks, learners will also learn to maintain a Windows 7 environment as well as support mobile users.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Identifying Cause of and Resolving Desktop Application Issues
2. Identifying Cause of and Resolving Networking Issues
3. Managing and Maintaining Systems That Run Windows 7 Client
4. Supporting Mobile Users

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **70** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK

**How is this unit assessed?**

Must be assessed by Portfolio.

# **Unit 4520-282      Windows 7, Enterprise Desktop Support Technician**

## Assessment Criteria

### **Outcome 1      Identifying Cause of and Resolving Desktop Application Issues**

The learner can:

1. Identify and resolve new software installation issues.
2. Identify and resolve software configuration issues.
3. Identify cause of and resolve software failure issues..

### **Outcome 2      Identifying Cause of and Resolving Networking Issues**

The learner can:

1. Identify and resolve logon issues.
2. Identify and resolve network connectivity issues.
3. Identify and resolve names resolution issues.
4. Identify and resolve network printer issues.

### **Outcome 3      Managing and Maintaining Systems That Run Windows 7 Client**

The learner can:

1. Identify and resolve performance issues.
2. Identify and resolve hardware failure issues

Outcome 4      The learner can:

1. Identify and resolve wireless connectivity issues.
2. Identify and resolve remote access issues.

**Level:** 2

**Credit value:** 3

**NDAQ number:** R/502/4385

### **Unit aim**

The aim of this unit is to give the learner the ability to decide which IT software application is appropriate to use to process different types of data, and to use a range of applications to produce and present information.

### **Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Select and use appropriate software applications to meet needs and solve problems
2. Enter, develop, combine and format different types of information to suit its meaning and purpose
3. Present information in ways that are fit for purpose and audience
4. Evaluate the selection and use of IT tools and facilities to present information

### **Guided learning hours**

It is recommended that **20** hours should be allocated for this unit, although patterns of delivery are likely to vary.

### **Details of the relationship between the unit and relevant national standards (if appropriate)**

This unit is linked to the Level 2 the National Occupational Standards for IT users devised by e-Skills UK (Sector Skills Council for ICT)

### **Support of the unit by a sector or other appropriate body (if required)**

This unit is endorsed by e-Skills UK, the Sector Skills Council for ICT

### **How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-288 IT Software Fundamentals

## Assessment Criteria

### **Outcome 1 Select and use appropriate software applications to meet needs and solve problems**

The learner can:

1. Describe what types of information are needed
2. Elect and use software applications to develop produce and present different types of information to meet needs and solve problems

### **Outcome 2 Enter, develop, combine and format different types of information to suit its meaning and purpose**

The learner can:

1. Enter, organise, refine and format different types of information, applying editing techniques to meet needs
2. Use appropriate techniques to combine image and text components
3. Combine information of different forms or from different sources
4. Select and use appropriate page layout to present information effectively.

### **Outcome 3 Present information in ways that are fit for purpose and audience**

The learner can:

1. Work accurately and proof-read, using software facilities where appropriate
2. Identify inconsistencies or quality issues with the presentation of information
3. Produce information that is fit for purpose and audience using accepted layouts and conventions as appropriate

### **Outcome 4 Evaluate the selection and use of IT tools and facilities to present information**

The learner can:

1. Review and modify work as it progresses to ensure the result is fit for purpose and audience and to inform future judgements
2. Review the effectiveness of the IT tools selected to meet needs in order to improve future works.

**Level:** 3  
**Credit value:** 12  
**UAN:** F/500/7159

**Unit aim**

The aim of this unit is to teach the concepts of providing support to customers, and the techniques to do this correctly. The unit initially focuses on building a relationship of trust with the customer, and also helps the learner understand how to gain the information needed to provide the required support. Learners will also learn to understand the implications of customer satisfaction and looks at compliance with any organisational guidelines. The learner is also expected to contribute to the delivery of good customer service.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand how to provide ICT customer care by developing customer relationships
2. Be able to provide ICT customer care by developing customer relationships
3. Be able to contribute to improving the delivery of service

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **100** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-301      Customer care in ICT**

## Assessment Criteria

### **Outcome 1      Understand how to provide ICT customer care by developing customer relationships**

The learner can:

1. Describe the uses of interpersonal communication techniques
2. Explain the different approaches and methods used for supporting technical and non-technical customers
3. Describe the organisational requirements for ICT customer care
4. Explain the effect of ICT customer care on the rest of the organisation

### **Outcome 2      Be able to provide ICT customer care by developing customer relationships**

The learner can:

1. Monitor compliance with organisational requirements for ICT customer support
2. Follow organisational guidelines and procedures to communicate with customers
3. Interact effectively with customers to achieve agreed outcome

### **Outcome 3      Be able to contribute to improving the delivery of service**

The learner can:

1. Describe the implications of customer satisfaction for the business
2. Describe the methods of measuring customer satisfaction levels
3. Suggest improvements to ICT service delivery
4. Handle complaints from customers following organisational guidelines
5. Gather specified customer satisfaction information
6. Analyse specified customer satisfaction information
7. Report on specified customer satisfaction information

**Level:** 3  
**Credit value:** 12  
**UAN:** H/602/2943

**Unit aim**

The aim of this unit is to give the learner a deeper understanding of Health and Safety. The learner will be expected to describe the difference between a hazard and a risk, and be able to identify hazards associated with particular activities. The learner will also be expected to monitor compliance with any legislation that applies to health and safety.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to carry out formal Health & Safety risk assessments in an ICT workplace.
2. Be able to monitor compliance with relevant parts of Health & Safety procedures in an ICT workplace;

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-302 Health and safety in ICT

## Assessment Criteria

### **Outcome 1 Be able to carry out formal Health & Safety risk assessments in an ICT workplace.**

The learner can:

1. Describe the difference between hazards and risks
2. Describe the types of Health & Safety hazard that can arise as a result of work activities, covering:
  - use of display screens
  - incorrect use of protective equipment
  - improper use of tools and equipment
  - lifting or handling heavy objects
  - excessive noise
  - electricity
  - hazardous substances
3. Identify relevant Health & Safety legislation and regulations
4. Describe the relevant content of identified legislation and regulations
5. Undertake formal Health & Safety risk assessments

### **Outcome 2 Be able to monitor compliance with relevant parts of Health & Safety procedures in an ICT workplace;**

The learner can:

1. Participate in audits of working practices and inspections of work
2. Gather and record information on Health & Safety
3. Initiate suitable actions to deal with identified breaches of Health & Safety
4. Describe specified parts of organisational Health & Safety procedures
5. Provide guidance to immediate colleagues on Health & Safety

**Level:** 3  
**Credit value:** 12  
**UAN:** A/500/7208

**Unit aim**

The aim of this unit is to teach the learner how to communicate effectively both in writing and verbally. The unit will help the learner understand how to correctly verbalise what needs to be said, by using different tones and intonation, as well as adapting their style depending on the audience. This unit will help the learner listen to what people have to say through techniques such as active listening.

This unit will also help the learner effectively communicate in writing; by looking at the way they structure their text. The unit will teach them the importance of using the correct grammar and spelling, as well as structuring their texts in certain ways depending on the intended need and audience.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to send and receive complex information by communicating interpersonally
2. Understand and use written communication techniques
3. Be able to provide guidance to immediate colleagues on how to communicate information

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **100** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-303      Interpersonal and written communication

## Assessment Criteria

### **Outcome 1      Be able to send and receive complex information by communicating interpersonally**

The learner can:

1. Apply knowledge of the following interpersonal communication concepts:
  - verbal (eg intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (eg smiling while talking on the phone, body language).
  - attentive listening (ie difference between hearing and listening).
  - positive and negative language.
  - active listening (eg summarising, paraphrasing, body language);
  - listening barriers (eg background noise, distractions, lack of concentration);
  - types of question (eg open, closed and probing).
  - how to adapt style (eg intonation, inflexion, business or technical terminology and vocabulary) to audience needs;
  - how to reduce listening barriers;
  - cultural differences
2. Use the following interpersonal communication techniques:
  - modulating voice when speaking to suit the listener or audience
  - articulating and expressing ideas clearly and concisely
  - listening actively (eg by taking notes)
  - clarifying and confirming understanding (eg by paraphrasing or repetition)
  - responding to questions with accurate information
  - ensuring content is appropriate to the needs of the audience
  - identifying and avoiding listening barriers
  - maintaining focus on the purpose of the communication
  - select appropriate communication styles;
  - adapt terminology and vocabulary to the needs of the audience;
  - reduce barriers to listening;
  - differentiate between facts and feelings

## **Outcome 2 Understand and use written communication techniques**

The learner can:

1. Apply knowledge of the following written communication concepts:
  - Grammar, spelling.
  - Business or technical terminology
  - Format and style for different communication channels (eg letter, memo, email and fax)
2. Use the following written communication techniques
  - following organisational guidelines and procedures;
  - identifying and conveying key messages in writing (eg letter, fax, email, database notes);
  - using correct grammar and spelling.
  - using and understanding appropriate business or technical terminology;
  - ensuring content, format and style are appropriate to the audience and channel (eg letter, memo, fax, email, web chat);
  - structuring writing into a logical framework;
  - conveying ideas and information in a clear and concise manner;
  - identifying relevant information in written communications;
  - reviewing or proof reading own written work.
  - developing messages that convey alternative viewpoints;
  - extracting key messages from written correspondence;
  - reviewing and editing documents created by others

## **Outcome 3 Be able to provide guidance to immediate colleagues on how to communicate information**

The learner can:

1. Provide guidance to immediate colleagues on how to communicate information

**Level:** 3  
**Credit value:** 9  
**UAN:** D/503/5549

**Unit aim**

The aim of this unit is to encourage the learner to look at themselves through understanding things such as their own development needs, how other people see them and understanding their role in their teams. This unit also teaches the learner about various legislations which govern the way we work in ICT. They are encouraged to look into professional bodies that are available to people working in this industry. This unit gives the learner an opportunity to reflect on working practices that could be improved.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to develop own personal and professional skills
2. Be able to work as a member of a team to achieve defined goals and implement agreed plans
3. Understand what is meant by professional practice
4. Understand the ethical and legislative environment relating to IT activities
5. Be able to Improve organisational effectiveness

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-304      Develop own effectiveness and professionalism**

## Assessment Criteria

### **Outcome 1    Be able to develop own personal and professional skills**

The learner can:

1. Identify own development needs and the activities needed to meet them
2. Obtain and review feedback from others on performance
3. Agree personal goals and participate in development activities to meet them

### **Outcome 2    Be able to work as a member of a team to achieve defined goals and implement agreed plans**

The learner can:

1. Effectively plan and manage own time
2. Recognise and respect diversity, individual differences and perspectives
3. Accept and provide feedback in a constructive and considerate manner
4. Understand the responsibilities, interests and concerns of colleagues
5. Identify and reduce obstacles to effective teamwork

### **Outcome 3    Understand what is meant by professional practice**

The learner can:

1. Describe the implications, and applicability for IT professionals of:
  - Data Protection Act
  - Computer Misuse Act
2. Identify the role of professional bodies for IT, and the benefits of membership to individuals and organisations
3. Describe quality management systems and standards for systems development

### **Outcome 4    Understand the ethical and legislative environment relating to IT activities**

The learner can:

1. Identify the types of conflicts of interest which can arise for IT professionals
2. Describe the impact on an IT organisation of legislation covering:
  - Processing of financial transactions
  - Health and Safety
  - Privacy, Confidentiality and Security
  - Copyright and Intellectual Property Rights

### **Outcome 5    Be able to Improve organisational effectiveness**

The learner can:

1. Describe the aims and objectives of the organisation
2. Describe the organisation's brand or image and how it can be promoted
3. Identify the organisation's structure, roles and responsibilities
4. Identify potential improvements to organisational effectiveness

**Level:** 3  
**Credit value:** 12  
**UAN:** R/601/3249

**Unit aim**

The aim of this unit is to teach the learner, how to investigate the needs of users by looking into their existing systems and will explore all of the techniques needed to do this effectively. The learner will then learn how to analyse this information, as well as learning the techniques needed to record the results on standard documentation.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to investigate existing systems and processes
2. Be able to analyse information to identify needs and constraints

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **75** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

**Outcome 1 Be able to investigate existing systems and processes**

The learner can:

1. Use three of the following investigative methods:
  - observations
  - examination of existing documents, records or software
  - questionnaires
  - site surveys
2. Record the results of investigations using standard documentation
3. Explain the importance of preserving the confidentiality of customer information

**Outcome 2 Be able to analyse information to identify needs and constraints**

The learner can:

1. Describe the type of defect, including inaccuracy, duplication and omission, which can arise in information
2. Describe the types of customer needs and constraints which can affect the design of an ICT system
3. Analyse information to identify customer needs for:
  - data to be stored and processed
  - functionality in terms of inputs, processes and outputs
  - capacity including numbers of users, throughput, and data storage
4. Analyse information to identify customer constraints
5. Record the results of analyses using standard documentation

**Level:** 3  
**Credit value:** 12  
**UAN:** D/500/7217

**Unit aim**

The aim of this unit is to teach some of the concepts of supporting IT systems remotely. Learners will learn which products can be supported and how they can be supported, as well as learning about any organisational requirements that govern this topic. Learners will also learn the customer care aspects of remote support such as customer service procedures. Whilst doing this, learners will learn how to follow any legislation.

This unit will also teach the learners how to provide and log the support given to users remotely, as well as communicating with users about products and services that may be available to them.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Understand the organisational requirements for customer care and the supported products and services
2. Be able to support products or services

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **100** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-306 Remote support for products and services

## Assessment Criteria

### **Outcome 1 Understand the organisational requirements for customer care and the supported products and services**

The learner can:

1. Describe the products and services to be supported including:
  - benefits of the products and services;
  - frequently used product or service options;
  - advanced features, benefits and options of products and services;
  - how to identify alternative products or services to meet customers needs;
  - how the products or services interact with others commonly available;
  - where to obtain information on infrequently used product or service features or options;
  - the impact of introducing new products and services
2. Describe the organisational requirements for customer care including:
  - customer service procedures (eg how to log customer information, how to initiate service calls, how to complete a sale);
  - authorisation procedures (eg how to confirm caller identity, how to validate requests);
  - escalation, resolution and complaint handling;
  - quality assurance procedures;
  - compliance with relevant legislation and regulations (eg data protection, financial services);
  - maintenance and communication of organisational brand or image;
  - organisational aims and objectives.

### **Outcome 2 Be able to support products or services**

The learner can:

1. Comply with organisational requirements
2. Confirm customer identity, validate requests and inform customers when authorisation criteria are not met
3. Communicate information on specified products or services;
  - identifying customers needs;
  - accurately collecting and logging relevant information from the customer;
  - providing product and service features to customers;
  - ensuring customer understanding of the information provided;
  - categorising requests and directing customers appropriately;
  - managing customer expectations (eg by confirming outcomes, timescales or costs);
  - discussing advantages and disadvantages of complex products and services;
  - discussing how the service product best fits the customers needs;
  - keeping customer informed on progress;
  - asking effective and appropriate probing questions
4. Make recommendations based on customer needs

5. Resolve and escalate requests and handle basic complaints

- using probing questions;
- displaying patience and understanding with demanding or emotional customers
- diffusing volatile situations using appropriate communication techniques;
- delivering difficult messages to customers and explaining the reasons behind the decision;
- assessing priority of complaints;
- resolving routine complaints

**Level:** 3  
**Credit value:** 12  
**UAN:** D/500/7220

**Unit aim**

The aim of this unit is to teach the learner some of the fundamentals surrounding the security of ICT systems. In order to do this the learner will learn to identify common types of security breaches. The learner will also learn to describe methods of protection for data and systems as well as applying some of the security measures they have learnt about.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Know the common types of security threat to an organisation, its IT system and its data, with relevant methods and procedures for protecting it
2. Be able to apply security measures
3. Be able to monitor security procedures

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **100** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-307 Security of ICT systems

## Assessment Criteria

### **Outcome 1 Know the common types of security threat to an organisation, its IT system and its data, with relevant methods and procedures for protecting it**

The learner can:

1. Describe the common types of security breach that can affect the organisation, such as:
  - unauthorised use of a system without damage to data;
  - unauthorised removal or copying of data or code from a system;
  - damage to or destruction of physical system assets and environment
  - damage to or destruction of data or code inside or outside the system
  - preventing normal use of a system (eg denial of service attack)
  - cultural differences
2. Describe specified data protection methods:
  - system data security facilities;
  - surveillance and monitoring methods;
  - effects of system configuration on data protection
3. Describe specified methods of providing physical security for ICT systems
  - access control devices (eg locks, biometric controls, CCTV) and their configuration
  - limiting visibility of data (eg by positioning of monitors, using encryption)
  - shielding (eg cable screening, Faraday cages)
  - types and appropriate uses of access records and authorisations
  - how to allocate access authority
4. Describe relevant organisational security procedures

### **Outcome 2 Be able to apply security measures**

The learner can:

1. Configure and apply specified security tools to identify and prevent breaches of security, such as:
  - internal system tools (eg passwords and permissions, malware scanning, firewall, VPN, authentication and encryption facilities)
  - external tools (eg access control devices)

### **Outcome 3 Be able to monitor security procedures**

The learner can:

1. Assist in ensuring compliance with organisational security procedures, including:
  - participating in security audits
  - gathering and recording information on security
  - initiating suitable actions to deal with identified breaches of security

**Level:** 3  
**Credit value:** 12  
**UAN:** R/500/7330

**Unit aim**

The aim of this unit teaches the learner how to install and/or upgrade various pieces of software. The unit also aims to teach the learner how to record information associated with software installations. The learner will learn how to install and/or upgrade software from differing locations as well as learning how to follow organisational guidelines and record their actions.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Understand the installation/upgrade process
2. Be able to carry out or control a wide range of installations or upgrades

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **100** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-308      Software installation and upgrade**

## Assessment Criteria

### **Outcome 1      Understand the installation/upgrade process**

The learner can:

1. Describe the software installation and upgrade process including:
  - procedures to be followed;
  - procedures for information recording.
  - software storage locations to be used;
  - specifications of the software
2. Describe the capabilities of software loading facilities

### **Outcome 2      Be able to carry out or control a wide range of installations or upgrades**

The learner can:

1. Provide guidance on installation/upgrade procedures to immediate colleagues
2. Obtain and allocate required materials
3. Select the installation/upgrade procedures to be followed
4. Select software loading facilities to be used

**Level:** 3  
**Credit value:** 12  
**UAN:** A/500/7340

**Unit aim**

The aim of this unit is to teach the learner how to operate different types of IT systems. In order to do this the learner will need to understand the procedures that are applicable to different systems. The learner will be able to describe functionality and the operational activities of particular systems, as well as knowing how to maintain and implement procedures for different systems.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Know how to operate the system
2. Be able to operate systems
3. Be able to maintain and implement system operating procedures

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **100** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-309      System operation

## Assessment Criteria

### **Outcome 1      Know how to operate the system**

The learner can:

1. Explain the operating procedures that are applicable to the system, such as:
  - required service levels (eg availability, quality)
  - routine maintenance
  - monitoring
  - data integrity (eg backups, anti-virus)
  - consumables use, storage & disposal
  - Health & Safety
  - escalation
  - information recording and reporting
  - obtaining work permissions
  - security & confidentiality
2. Describe system functionality during normal operation.
3. Describe the effects of operational activities on system functionality

### **Outcome 2      Be able to operate systems**

The learner can:

1. Use and operate the system following appropriate procedures
2. Identify system faults and resolve or escalate system faults as appropriate
3. Gather and record specified operational information
4. Assess and minimise risks such as:
  - loss or corruption of data
  - loss of service
  - damage to equipment
  - effects on customer operations

### **Outcome 3      Be able to maintain and implement system operating procedures**

The learner can:

1. Provide advice and guidance on system operation to immediate colleagues
2. Select the procedures to be followed
3. Schedule operational activities to minimise disruption to system functionality
4. Collate operational information

**Level:** 3  
**Credit value:** 12  
**UAN:** J/601/3507

**Unit aim**

The aim of this unit is to teach the learner how to provide technical support and to identify the purpose of giving such support and guidance. In order to this the learner will learn how technical advice and guidance can be used, and identify the types of information that can aid the user being supported. ]

As part of this unit the learner will identify the purposes of IT technical support through providing support to different user types and know what to do when support or guidance fails. All of this will be done whilst following organisational guidelines.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand the context for providing technical advice and guidance
2. Be able to provide reactive technical advice and guidance to customers on a range of topics
3. Be able to provide proactive technical advice and guidance to customers

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **75** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-310      Technical advice and guidance

## Assessment Criteria

### **Outcome 1      Understand the context for providing technical advice and guidance**

The learner can:

1. Describe how technical advice and guidance can be used to:
  - resolve problems
  - improve performance
2. Describe the types, sources and applicability of information which can form the basis of technical advice and guidance:
  - information from reference sources (eg manuals, handbooks, manufacturer's specifications)
  - information derived from the analysis of data (eg trend analysis, fault logs)
  - online information (eg manufacturer's websites, technical fora, discussion groups)
3. Describe the procedures and constraints which can apply to the provision of technical advice and guidance (eg escalation, commercial/contractual, legal/regulatory, information security)
4. Identify circumstances where technical advice and guidance should be provided proactively rather than reactively in response to customer requests (eg to rectify known faults, to provide new functionality)

### **Outcome 2      Be able to provide reactive technical advice and guidance to customers on a range of topics**

The learner can:

1. Determine the purposes for which technical advice and guidance is required
2. Verify that customers are entitled to receive the requested technical advice and guidance
3. Communicate effectively with customers to elicit sufficient information to enable correct technical advice and guidance to be provided
4. Source and interpret relevant technical information to produce advice and guidance in response to customer requests
5. Communicate technical advice and guidance to customers in a format and style which meets their needs, confirming customer understanding of the information provided
6. Follow organisational procedures for responding to customer requests including the timely escalation of those for which technical advice and guidance can not be provided or does not resolve the request

### **Outcome 3      Be able to provide proactive technical advice and guidance to customers**

The learner can:

1. Identify the purposes for which the technical advice and guidance is required
2. Identify the customers, and their level of technical knowledge, to whom the technical advice and guidance should be provided
3. Develop technical advice and guidance in a format and style which takes into account the customers' level of technical knowledge
4. Follow organisational procedures for providing proactive technical advice and guidance

**Level:** 3  
**Credit value:** 12  
**UAN:** A/601/3293

**Unit aim**

The aim of this unit is to learn the processes involved in technical fault diagnosis, in order to do that the learner will be able to identify the steps involved in providing a diagnosis, including identifying the steps involved in validating the fault and gathering information. The learner will also learn how to use different diagnosing tools. They will explore, in depth, the steps involved in diagnosing faults and what to do when they need to escalate the issue. The learner will diagnose faults with a wide range of causes, and select remedies for non-routine faults and understand the importance of maintaining records.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand the processes, methods and information that are used in the diagnostic process
2. Be able to diagnose faults with a wide range of causes
3. Be able to select remedies for non-routine faults
4. Be able to maintain diagnosis and remedy records

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **75** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-311      Technical fault diagnosis

## Assessment Criteria

### **Outcome 1      Understand the processes, methods and information that are used in the diagnostic process**

The learner can:

1. Describe the steps of the diagnostic process including:
  - fault validation
  - information gathering
  - information analysis
  - solution identification
2. Describe the types of diagnostic information that are commonly needed:
  - problem description
  - problem history
  - problem location
  - technical information on a specified range of products including the system under investigation
3. Explain the following diagnostic methods and give examples of their appropriate use:
  - substitution
  - replication
  - performance and functional testing
  - environment change
4. Explain how the following considerations can affect fault diagnosis.
  - minimisation of service disruption during diagnostics
  - individual responsibility and authority
  - escalation procedure
  - service level agreements
5. Interpret detailed technical information on a range of products

### **Outcome 2      Be able to diagnose faults with a wide range of causes**

The learner can:

1. Select and correctly use appropriate diagnostic tools to carry out non-routine diagnosis
2. Select and use given sources of diagnostic and other technical information
3. Identify and interpret relevant information to support the diagnosis
4. Analyse information to diagnose faults with a wide range of causes, using at least three of the following approaches:
  - trend analysis
  - what-if scenarios
  - gap analysis
  - identification of cause and effect
  - flow charts
5. Describe possible ways to prevent reoccurrence of diagnosed faults

### **Outcome 3 Be able to select remedies for non-routine faults**

The learner can:

1. Select a suitable remedy to rectify identified faults taking into account the following:
  - business or service impact
  - resource and skill availability
  - ease of implementation
  - cost effectiveness
  - performance
  - compatibility
  - time
  - permanence
2. Identify possible ways to prevent reoccurrence of diagnosed faults

### **Outcome 4 Be able to maintain diagnosis and remedy records**

The learner can:

1. Accurately document the diagnosis activities undertaken including:
  - fault description
  - supporting information
  - diagnostic tools etc used
  - cause of fault
  - remedy selected

**Level:** 3  
**Credit value:** 10  
**UAN:** L/502/1114

**Unit aim**

The aim of this unit is to teach some of the key aspects involved in project management. In order to this the learner will learn about the roles and responsibilities of the people involved in project management. The learner will also learn how to identify the documentation used and the key criteria that must be satisfied in order to deliver a successful project.

This unit also aims to teach the learner how to collect information that is required during a project and to look at differing lifecycle examples used for the management of projects. This unit will enable within the project environment.

**Learning outcomes**

There are **seven** learning outcomes to this unit. The learner will:

1. Be able to describe programmes, projects and project management, and the key differences when compared to Business As Usual (BAU)
2. Be able to apply the principles of Project Risk Management
3. Be able to apply the principles of project quality management, change control and configuration management
4. Be able to use different styles of management and types of communication within a project environment
5. Understand team building and team dynamics using standard models
6. Be able to describe typical activities and the practical problems of estimating throughout a project/system development lifecycle
7. Be able to apply project planning, monitoring, and control techniques

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-312 IT Project Management 3

## Assessment Criteria

### **Outcome 1 Be able to describe programmes, projects and project management, and the key differences when compared to Business As Usual (BAU)**

The learner can:

1. Draw representations of 3 different types of project organisation structure

### **Outcome 2 Be able to apply the principles of Project Risk Management**

The learner can:

1. Specify and prioritise Project Risks
2. Specify a risk as an opportunity or a threat in a work placement / business situation
3. Create and maintain a Risk Log / Register
4. Compile an assessment of Risk Exposure for a given project

### **Outcome 3 Be able to apply the principles of project quality management, change control and configuration management**

The learner can:

1. Complete a supplier evaluation process from given data
2. Compose a Quality Plan for a given project
3. Devise suitable measurements for given quality characteristics
4. Decide the action to be taken for a Request for Change (RFC)
5. Devise a suitable Configuration Item Record (CIR) for a given product

### **Outcome 4 Be able to use different styles of management and types of communication within a project environment**

The learner can:

1. Use communication methods to suit the purpose of the communication
2. Use a management style to suit the requirements of the situation

### **Outcome 5 Understand team building and team dynamics using standard models**

The learner can:

1. Differentiate between the stages of team development recognising characteristic behaviours of each stage
2. Describe the desirable characteristics in terms of both skill and behaviour of a Project Manager
3. Describe the Tuckman model of Team Development
4. Explain the use of models such as Tuckman in developing an effective team (team building)
5. List and characterise the main attributes of the nine Belbin Team Types

## **Outcome 6 Be able to describe typical activities and the practical problems of estimating throughout a project/system development lifecycle**

The learner can:

1. Draw a system lifecycle for a project
2. Justify the choice of a system development lifecycle
3. Create a project estimate

## **Outcome 7 Be able to describe programmes, projects and project management, and the key differences when compared to Business As Usual (BAU)**

The learner can:

1. Prepare a representative Work Breakdown Structure (WBS)
2. Construct a representative PBS
3. Produce an Activity on Node (AoN) Network from a list of activities and their dependencies
4. Identify the critical path on a complex project network
5. Calculate the earliest and latest start and finish dates (ES, EF, LS, LF.) and the resulting float (Free and Total)
6. Construct a Gantt chart from an activity network
7. Update a project schedule to reflect actual progress
8. Compile a Milestone Slippage Chart
9. Create a project progress report for the project sponsor
10. Demonstrate Resource Smoothing
11. Select resourcing priorities
12. Create a Cumulative resource chart
13. Interpret Earned Value figures
14. Create a graphical representation of progress information
15. Extrapolate Project Outcome using Earned Value Management (EVM) Data

**Level:** 3  
**Credit value:** 12  
**UAN:** F/500/7355

### Unit aim

The aim of this unit is to introduce the principles of testing ICT systems. In order to do this the learner will learn how to select relevant tests, whilst performing these tests the learner will be shown how to record the outcomes and learn how to prepare their test environment correctly and safely. The learner will also learn to understand how to follow service level agreements and how to use different types of testing tools depending of the situation. The learner will learn how to present and record their findings and know the importance of doing so.

### Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Know technical information about a wide range of products, testing procedures and associated activities, equipment to be used and the reasons for the test
2. Be able to carry out testing and support others in the testing process

### Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **100** hours should be allocated for this unit.

### Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

### How is this unit assessed?

Assessment is by a learner portfolio.

# Unit 4520-313      Testing ICT systems

## Assessment Criteria

### **Outcome 1      Know technical information about a wide range of products, testing procedures and associated activities, equipment to be used and the reasons for the test**

The learner can:

1. Describe the testing process to be followed
  - how to select tests and collect relevant and sufficient information for the test to be successful
  - how to minimise service disruption during testing and avoid detrimental effects or changes to performance
  - ways to configure tests
  - how to record, maintain or restore configurations, data and functionality
  - types of service level agreements
  - individual responsibility and authority
  - escalation procedures and risks associated with using a testing process
  - information analysis (level 3)
2. Describe the purposes of testing
  - aiding the diagnostic process
  - comparing actual and expected performance
  - testing performance
3. Describe what test preparation and conclusion activities are necessary for specific tests, such as:
  - Health & safety legislation and regulations
  - need to obtain work permissions
  - site access and security
  - system or equipment integrity (eg ensuring network service continuity)
  - data integrity (eg taking data backups before commencing work)
  - resource availability
  - level of service allowed by the SLA
  - environmental legislation and regulations (eg disposal of materials)
  - work sign-off and reporting
  - site restoration .system and equipment integrity (eg restoring service)
  - data integrity (eg restoring data backups as necessary)
4. Interpret detailed technical information on a specified range of products

## **Outcome 2 Be able to carry out testing and support others in the testing process**

The learner can:

1. Provide technical advice to support testing
2. Select any necessary preparation and conclusion activities and ensure that they have been completed
3. Select, adapt and use appropriate testing tools:
  - electrical/electronic test instruments
  - on-board self-test programs
  - loopback devices
  - on-line/remote monitoring software
  - software debuggers
  - runtime analysers
  - diagnostic software
4. Gather, record and respond to test information and results by:
  - interpreting error codes/messages
  - comparing with specifications
  - identifying inconsistent data
  - examining results from multiple tests or trend analysis
  - using analytical tools to extract information from test data

**Level:** 3  
**Credit value:** 12  
**UAN:** M/500/7383

**Unit aim**

The aim of this unit is to teach the learner how to work effectively with ICT hardware and equipment, they will learn correct working processes and practice, depending on the equipment they are using, and be able to identify which tools might be required. They will also learn how to plan work and deal with the expectations of customers. The learner will be trained about any regulatory requirements that may affect work activities. They will also have the opportunity to work with ICT hardware and equipment and implement some of the techniques they have learnt, all the time communicating progress and avoiding any unnecessary disruptions to service.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Know how to plan and carry out or direct a wide range of work activities
2. Be able to plan and carry out or direct a wide range of work activities
3. Be able to minimise risks related to work activities

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **100** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-314      Working with ICT hardware and equipment**

## Assessment Criteria

### **Outcome 1      Know how to plan and carry out or direct a wide range of work activities**

The learner can:

1. Describe the working process such as:
  - tools and techniques to be used
  - procedures to be followed
  - procedures for information recording
  - customer requirements
  - product specifications
  - work planning
  - resource allocation
2. Describe the appropriate uses of tools and techniques
3. Explain which regulatory requirements affect work activities and how they do so

### **Outcome 2      Be able to plan and carry out or direct a wide range of work activities**

The learner can:

1. Select, adapt and use relevant tools and techniques safely
2. Provide technical advice to support working procedures such as:
  - Health & Safety
  - quality
  - use of tools
  - configuration
  - testing; logistics
  - waste disposal
  - problem escalation
  - information recording
  - obtaining work permissions
  - security and confidentiality
  - customer acceptance
  - commissioning
  - product registration
  - integration
3. Obtain and allocate required materials
4. Record relevant information
5. Communicate the progress and outcome of work to the appropriate people

### **Outcome 3 Be able to minimise risks related to work activities**

The learner can:

1. Provide support and advice in assessing and minimising risks related to work activities such as:
  - loss or corruption of data
  - loss of service
  - damage to equipment
  - effects on customer operations

**Level:** 3  
**Credit value:** 10  
**UAN:** F/601/3165

**Unit aim**

The aim of this unit is to teach computer game development; in order to do this the learner will explore the various architecture and hardware components. The learner will explore developments within the computer games industry that are required in the development of computer games. They will also evaluate existing games and will also look at the different features of a range of computer games.

The learner will propose a plan for developing a sample game and then move into planning and developing and testing elements of that game.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Understand computer game architecture and components
2. Understand the computer games industry
3. Be able to evaluate existing computer games
4. Be able to develop a computer game specification
5. Be able to implement elements of a computer game

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **71** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-315 Computer games development

## Assessment Criteria

### **Outcome 1 Understand computer game architecture and components**

The learner can:

1. Describe the hardware and software components of a video game system

### **Outcome 2 Understand the computer games industry**

The learner can:

1. Describe the stages of evolution of computer game industry
2. Describe the roles and activities required to develop modern computer games
3. Explain computer game development processes and terminology
4. Explain computer game programming methods and techniques

### **Outcome 3 Be able to evaluate existing computer games**

The learner can:

1. Produce a structured evaluation of an existing computer game

### **Outcome 4 Be able to develop a computer game specification**

The learner can:

1. Produce a pre-production proposal document for a computer game project
2. Identify the components required to develop a computer game
3. Produce an implementation plan for a computer game development

### **Outcome 5 Be able to implement elements of a computer game**

The learner can:

1. Design components of a computer game
2. Develop components of a computer game
3. Test components of a computer game

# Unit 4520-316      Data modelling

**Level:**                3  
**Credit value:**      9  
**UAN:**                L/601/3203

## Unit aim

The aim of this unit is to teach the concepts of data modelling. The learner will be taught about the basic concepts; including entities, attributes and relationships, and will also learn the objectives of normalisation to 3<sup>rd</sup> normal form as well as putting this into practice. The learner will use what they have learnt to produce logical data model.

## Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Understand the concepts of logical data modelling
2. Be able to use data modelling techniques to create logical data models
3. Be able to use data modelling techniques to refine logical data models

## Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **75** hours should be allocated for this unit.

## Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

## How is this unit assessed?

Assessment is by a learner portfolio.

# Unit 4520-316 Data modelling

## Assessment Criteria

### **Outcome 1 Understand the concepts of logical data modelling**

The learner can:

1. Describe entities and the types of attributes which can be assigned to them
2. Describe the type of relationships which can exist between entities
3. Explain the objectives of data normalisation and describe the Third Normal Form (3NF)
4. Explain the purpose of keys
5. Describe an application where un-normalized or de-normalised data may be used
6. Describe the types of standard notation which can be used to represent data sets as logical data models

### **Outcome 2 Be able to use data modelling techniques to create logical data models**

The learner can:

1. Identify and name entities, assigning the correct attributes
2. Identify and represent entity relationships, assigning the correct type
3. Normalise a data set to Third Normal Form (3NF)

### **Outcome 3 Be able to use data modelling techniques to refine logical data models**

The learner can:

1. Identify entities which will be accessed for enquiry and/or update
2. Identify access sequences and triggers
3. Create access rules/methods
4. Use a standard notation to describe the logical data model of a normalised data set

**Level:** 3  
**Credit value:** 9  
**UAN:** D/500/7332

**Unit aim**

The aim of this unit is to teach the concepts behind managing computer systems. The learner will gain knowledge of how the configuration of a computer system can affect the management of it. The learner will also be taught the importance of asset management. They will have an opportunity to use what they have learnt and modify a computer system according to guidelines given to them.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Understand how to administer a system
2. Be able to administer a system and change system configurations

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **75** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-317 System management

## Assessment Criteria

### **Outcome 1 Understand how to administer a system**

The learner can:

1. Describe how to configure the system
2. Describe ICT asset and configuration information applicable to the system such as:
  - Physical attributes (eg manufacturer, type, revision, serial number, location, value)
  - Configuration (eg physical and logical addresses, options set, connections)
3. Describe how available options for system configuration affect functionality and capacity

### **Outcome 2 Be able to administer a system and change system configurations**

The learner can:

1. Select configuration options to optimise system functionality and capacity
2. Make changes to system configuration
3. Specify items for which ICT asset and configuration information is to be recorded)

**Level:** 3  
**Credit value:** 9  
**UAN:** K/500/7379

**Unit aim**

The aim of this unit is to teach the learner how to create and modify user profiles. In order to this they will be taught how to create a user identifier and how to work with passwords and the frequency with which they need to be modified. The learner will also discover the differences between different user types and will have an opportunity to create new (and modify existing) user account settings.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Know how to administer user profiles
2. Be able to administer user profiles

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-319      User profile administration

## Assessment Criteria

### **Outcome 1    Be able to administer user profiles**

The learner can:

1. Describe the organisational policy on user profiles such as:
  - user identifier (eg username);
  - password and related information (eg change frequency);
  - allowed system access (eg times, locations)
  - allowed access to facilities (eg data, software)
2. Describe how to create and edit user and standard profiles
3. Describe how user profiles affect access to system facilities such as:
  - shared resources (eg data storage, printers)
  - software
  - data

### **Outcome 2    Be able to administer a system and change system configurations**

The learner can:

1. Make specified changes to user profiles
2. Specify user profiles to meet individual requirements
3. Create standard profiles for groups of users
4. Provide guidance on user profiles to immediate colleagues

**Level:** 3  
**Credit value:** 12  
**UAN:** L/601/3184

**Unit aim**

This unit covers more advanced concepts of object oriented computer languages and their use to implement, refine and test computer programs.

The aim of this unit is to teach the concepts of object oriented programming, in order to this the learner will learn some of the key features of an object oriented environment. For example they will learn how to declare structures and use standard input and output commands. They will have an opportunity to use what they have learnt by refining an exiting program to improve its quality. The learner will test the amended program, comparing actual with expected results, and will learn to document a program and create a user guide.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to Implement a software design using object oriented programming
2. Be able to refine an object oriented program to improve quality
3. Be able to test the operation of an object oriented driven program
4. Be able to document an object oriented driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

# Unit 4520-320      Creating an object oriented computer program using C++

## Assessment Criteria

### Outcome 1      Be able to implement a software design using object oriented programming

The learner can:

1. Identify the objects and data and file structures required to implement a given design
2. Select, declare and initialise variable and data structure types and sizes to implement design requirements
3. Define relationships between objects to implement design requirements
4. Implement message passing between objects to implement design requirements
5. Implement object behaviours using control structures to meet the design algorithms
6. Select and declare file structures to meet design file storage requirements
7. Select and use standard input/output commands to implement design requirements
8. Make effective use of operators and predefined functions
9. Make effective use of an Integrated Development Environment (IDE) including code and screen templates

#### Additional guidance:

The learner will be able to

- describe the data types int, float, double and char and the data qualifiers long, short, signed and unsigned
- explain the use of static, auto and const in declarations
- explain that a pointer is a variable that holds the memory address of another variable
- describe the use of the NULL pointer
- describe the component parts of a string
- describe the format of a struct and the use of an array of type struct
- explain the use of one and two-dimensional arrays of data type: int[], char[], float[]
- describe the use of header files to define constants and external functions
- explain that data within an object cannot be accessed directly but is accessed through its interface
- explain that an object's interface is the functions and parameters defined within the object that can be accessed by other objects
- describe how message passing between objects means that a function within one object is called by another object and data is passed through the function's defined parameters
- describe how a value can be returned by a called function
- explain how default parameters are used
- explain how functions can be overloaded
- describe the use of const when passing parameters between functions
- explain the use of the private and public qualifiers
- describe control structures used for loops ie while, do ... while, for
- describe control structures used for selection ie if, if ... else, switch
- explain the file types text and binary
- describe the purpose of the file streams fstream, istream, ostream
- explain how file streams can be used to write to a file, read from a file and append to a file

- describe the use of cin and cout for standard input and output
- describe the relational operators: < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), == (equal to), != (not equal to)
- describe the logical operators: ! (not), && (and), || (or)
- describe the predefined functions: getch(), cin.getline(), gets(), puts(), atoi(), atof(), strcpy(), strcat(), strlen(), toupper(), tolower()
- explain the use of the increment (++) and decrement (--) operators in prefix and postfix mode
- describe the arithmetic operators ie \* (multiply), / (divide), - (subtract), + (add), % (modulus)
- state the difference between the assignment operator (=) and the relational operator (==)
- describe the use of the assignment operators: +=, -=, \*=, /=, %=

## **Outcome 2 Be able to refine an object oriented program to improve quality**

The learner can:

1. Use an agreed standard for naming, comments and code layout
2. Make effective use of encapsulation, polymorphism and inheritance
3. Implement data validation for inputs
4. Identify and implement opportunities for error handling and reporting

### **Additional guidance:**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for objects, variables and functions and that constants are normally identified using uppercase characters and variables using lowercase characters
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- describe how screen prompts are used to provide information to a user about the actions that can be taken when an error occurs

## **Outcome 3 Be able to test the operation of an object oriented driven program**

The learner can:

1. Make effective use of the debugging facilities available in the IDE
2. Prepare a test strategy
3. Select suitable test data and determine expected test results
4. Record actual test results to enable comparison with expected results
5. Analyse actual test results against expected results to identify discrepancies
6. Investigate test discrepancies to identify and rectify their causes

### **Additional guidance:**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables

- explain the purpose of a test plan is, for each test to be performed, to identify the type of test, the test data required and the expected results of the test
- state that test data should contain valid and invalid data
- explain the purpose of a test log is to record the actual results of each test in the test plan, comment on any discrepancies between the actual results and the expected results and record if any amendments are made to correct an error
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

#### **Outcome 4 Be able to document an object oriented driven program**

The learner can:

1. Create on-screen help to assist the users of a computer program
2. Create documentation for the support and maintenance of a computer program

#### **Additional guidance:**

The learner will be able to

- describe how screen prompts are used to provide information to a user about the actions that can be taken
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification, program listing, class interfaces, test plan and test results

**Level:** 3  
**Credit value:** 12  
**UAN:** R/601/3171

**Unit aim**

This unit covers more advanced concepts of procedural computer languages and their use to implement, refine and test computer programs.

The aim of this unit is to teach the concepts of procedural programming, as part of this unit the learner will learn some of the key elements of a procedural language such as how to declare file structures and how to use some of the predefined functions. The learner will have an opportunity to use what they have learnt by modifying an existing program to improve its quality. The learner will test the revised code and record expected and actual results they will also learn to document a program and create a user guide.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to implement a software design using procedural programming
2. Be able to refine a procedural program to improve quality
3. Be able to test the operation of a procedural driven program
4. Be able to document a computer program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

**Outcome 1 Be able to implement a software design using procedural programming**

The learner can:

1. Identify the program modules and data and file structures required to implement a given design
2. Select, declare and initialise variable and data structure types and sizes to implement design requirements
3. Select and implement control structures to meet the design algorithms
4. Select and declare file structures to meet design file storage requirements
5. Select and use standard input/output commands to implement design requirements
6. Make effective use of operators and predefined functions
7. Correctly use parameter passing mechanisms

**Additional guidance:**

The learner will be able to

- describe the PICTURE clause required for a given data item: alphanumeric, alphabetic, numeric, numeric edited
- define the relationships between group and elementary data items
- describe the use of literals and figurative constants
- describe how a one-dimensional and two-dimensional array can be declared, initialised and accessed
- describe the operations that can be performed on a table (array)
- move data between tables
- set up initial values in a table
- search the data items in a table using a sequential search
- use the SEARCH statement to search a table
- sort the data items in a table using the PERFORM statement with the VARYING clause
- describe the operation of the COMPUTE statement
- describe control structures used for selection ie IF, IF ... ELSE, EVALUATE
- explain the meaning of each clause within the SELECT statement in the ENVIRONMENT DIVISION for an indexed sequential file or a relative file
- describe how an indexed sequential file or a relative file can be opened for INPUT, OUTPUT, I-O or EXTEND
- describe the process of inserting, amending and deleting a record in an indexed sequential or relative file
- explain the access modes SEQUENTIAL, RANDOM AND DYNAMIC that can be used for an indexed sequential or relative file
- explain the purpose of the START statement when an indexed sequential or relative file is in SEQUENTIAL access mode
- state the purpose of the INVALID KEY clause for input and output operations on an indexed sequential or relative file
- describe the use of the ACCEPT and DISPLAY statements for standard input and output

- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), = (equal to), NOT= (not equal to)
- describe the logical operators AND, OR, NOT
- describe the arithmetic operators ie ADD, SUBTRACT, MULTIPLY and DIVIDE
- describe the use, in arithmetic statements, of the following clauses: ON SIZE ERROR, ROUNDED
- explain how the STRING statement can be used to combine two or more data items
- explain how the UNSTRING statement can be used to separate one data item into multiple data items

## **Outcome 2 Be able to refine a procedural program to improve quality**

The learner can:

1. Use an agreed standard for naming, comments and code layout
2. Define user functions to replace repeating code sequences
3. Implement data validation for inputs
4. Identify and implement opportunities for error handling and reporting

### **Additional guidance:**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for variables
- state that meaningful comments are inserted in code to aid understanding of the code
- explain the use of the PERFORM statement to provide the execution of loops
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken when an error occurs

## **Outcome 3 Be able to test the operation of a procedural driven program**

The learner can:

1. Make effective use of available debugging tools
2. Prepare a test strategy
3. Select suitable test data and determine expected test results
4. Record actual test results to enable comparison with expected results
5. Analyse actual test results against expected results to identify discrepancies
6. Investigate test discrepancies to identify and rectify their causes

### **Additional guidance:**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- explain the purpose of a test plan is, for each test to be performed, to identify the type of test, the test data required and the expected results of the test
- state that test data should contain valid and invalid data

- explain the purpose of a test log is to record the actual results of each test in the test plan, comment on any discrepancies between the actual results and the expected results and record if any amendments are made to correct an error
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

#### **Outcome 4 Be able to document a computer program**

The learner can:

1. Create documentation to assist the users of a computer program
2. Create documentation for the support and maintenance of a computer program

#### **Additional guidance:**

The learner will be able to

- state that the purpose of end user documentation is to help the user to operate the software
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification program listing, test plan and test results

**Level:** 3  
**Credit value:** 12  
**UAN:** F/601/3179

**Unit aim**

The aim of this unit is to teach the concepts of event driven programming, in order to do this the learner will learn some of the features of an event driven environment such as using standard input and output commands and use the integrated development environment effectively. The learner will also have an opportunity to use what they have learnt by modifying an existing program to improve its quality. They will test their amended costs against actual and expected outcomes.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to implement a software design using event driven programming
2. Be able to refine an event driven program to improve quality
3. Be able to test the operation of an event driven program
4. Be able to document an event driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

**Outcome 1 Be able to implement a software design using event driven programming**

The learner can:

1. Identify the screen components and data and file structures required to implement a given design
2. Select, declare and initialise variable and data structure types and sizes to implement design requirements
3. Select and assign properties to screen components to implement design requirements
4. Select and associate events (including parameter passing) to screen components to implement design requirements
5. Implement event handling using control structures to meet the design algorithms
6. Select and declare file structures to meet design file storage requirements
7. Select and use standard input/output commands to implement design requirements
8. Make effective use of operators and predefined functions
9. Make effective use of an Integrated Development Environment (IDE) including code and screen templates

**Additional guidance:**

The learner will be able to

- explain the purpose and action of the following controls: Data, CommonDialog, ComboBox, Image, ListBox, PictureBox, CheckBox, TextBox
- describe the purpose of a bound control
- describe the features of a record structured database
- identify appropriate data types for the fields in a given record eg text, date, logical, numeric. currency
- state that a primary key is used to uniquely identify a record
- explain how the properties of bound controls can be set to enable access to database records
- explain the use of the Type definition to create a user defined variable with two or more elements
- describe the use of an array of data type integer or string
- describe the properties of the following controls: Data, CommonDialog, ComboBox, Image, ListBox, PictureBox, CheckBox, TextBox
- describe control structures used for selection ie If, If ... Else, Select Case
- describe control structures for loops ie For ... Next, Do While ... Loop, Do ... Loop While
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), = (equal to), <> (not equal to)
- describe the logical operators AND, OR, NOT
- describe the arithmetic operators ie + (add), - (subtract), \* (multiply), / (divide), MOD (modulus)
- describe the assignment operator =
- describe functions that can be used for concatenating and manipulating a string
- explain the use of the isNumeric, Val and StrComp functions

- explain how data from a database can be connected to bound controls on a form
- state the syntax and structure of basic SQL queries
- explain how an SQL query can be embedded in the code
- describe the use of the Randomize statement and the Rnd function to generate random integer numbers
- explain the use of the following methods for controls: Clear, Cls, Print, PrintForm, SetFocus
- explain the use of the drawing methods: Line, Circle, Pset
- describe the use of the Drag method and the DragDrop event to initiate actions

## **Outcome 2 Be able to refine an event driven program to improve quality**

The learner can:

1. Use an agreed standard for naming, comments and code layout
2. Define user functions to replace repeating code sequences
3. Implement data validation for inputs
4. Identify and implement opportunities for error handling and reporting

### **Additional guidance:**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for forms, controls and variables
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken after an error

## **Outcome 3 Be able to test the operation of an event driven program**

The learner can:

1. Make effective use of the debugging facilities available in the IDE
2. Prepare a test strategy
3. Select suitable test data and determine expected test results
4. Record actual test results to enable comparison with expected results
5. Analyse actual test results against expected results to identify discrepancies
6. Investigate test discrepancies to identify and rectify their causes

### **Additional guidance:**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- explain the purpose of a test plan is, for each test to be performed, to identify the type of test, the test data required and the expected results of the test
- state that test data should contain valid and invalid data

- explain the purpose of a test log is to record the actual results of each test in the test plan, comment on any discrepancies between the actual results and the expected results and record if any amendments are made to correct an error
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

#### **Outcome 4 Be able to document an event driven program**

The learner can:

1. Create on-screen help to assist the users of a computer program
2. Create documentation for the support and maintenance of a computer program

#### **Additional guidance:**

The learner will be able to

- describe how screen prompts or tool tips are used to provide information to a user
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification program listing, test plan and test results

**Level:** 3  
**Credit value:** 12  
**UAN:** L/601/3184

**Unit aim**

This unit covers more advanced concepts of object oriented computer languages and their use to implement, refine and test computer programs.

The aim of this unit is to teach the concepts of object oriented programming, in order to this the learner will learn some of the key features of an object oriented environment. For example they will learn how to declare structures and use standard input and output commands. They will have an opportunity to use what they have learnt by refining an exiting program to improve its quality. The learner will test the amended program, comparing actual with expected results, and will learn to document a program and create a user guide.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to implement a software design using object oriented programming
2. Be able to refine an object oriented program to improve quality
3. Be able to test the operation of an object oriented driven program
4. Be able to document an object oriented driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

**Outcome 1 Be able to implement a software design using object oriented programming**

The learner can:

1. Identify the objects and data and file structures required to implement a given design
2. Select, declare and initialise variable and data structure types and sizes to implement design requirements
3. Define relationships between objects to implement design requirements
4. Implement message passing between objects to implement design requirements
5. Implement object behaviours using control structures to meet the design algorithms
6. Select and declare file structures to meet design file storage requirements
7. Select and use standard input/output commands to implement design requirements
8. Make effective use of operators and predefined functions
9. Make effective use of an Integrated Development Environment (IDE) including code and screen templates

**Additional guidance**

The learner will be able to

- describe the data types: byte, int, float, double, boolean and char and the data qualifiers long, short, signed and unsigned
- describe the use of String and StringBuffer classes to manipulate strings
- explain the use of arrays of data type: byte, int, char, float, double
- describe the use of header files to define constants and external functions
- explain that data within an object cannot be accessed directly but is accessed through its interface
- explain that an object's interface is the functions and parameters defined within the object that can be accessed by other objects
- describe how message passing between objects means that a function within one object is called by another object and data is passed through the function's defined parameters
- describe how a value can be returned by a called function
- explain the use of the private and public qualifiers
- explain the purpose of overloading methods
- describe control structures used for loops ie while, do ... while, for
- describe control structures used for selection ie if, if ... else, switch
- explain the use of packages and the purpose of the import statement
- describe the use of System.in.read() for standard input and System.out.print() and System.out.println() for standard output
- describe the relational operators: < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), == (equal to), != (not equal to)
- describe the logical operators: ! (not), && (and), || (or)
- explain the use of the increment (++) and decrement (--) operators in prefix and postfix mode
- describe the arithmetic operators ie \* (multiply), / (divide), - (subtract), + (add), % (modulus)

- state the difference between the assignment operator (=) and the relational operator (==)
- describe the use of the assignment operators: +=, -=, \*=, /=, %=

## **Outcome 2 Be able to refine an object oriented program to improve quality**

The learner can:

1. Use an agreed standard for naming, comments and code layout
2. Make effective use of encapsulation, polymorphism and inheritance
3. Implement data validation for inputs
4. Identify and implement opportunities for error handling and reporting

### **Additional guidance**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for objects, variables and functions and that constants are normally identified using uppercase characters and variables using lowercase characters
- state that meaningful comments are inserted in code to aid understanding of the code
- describe Java inheritance for a class and the use of **this** and **extends**
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- describe the use of try ... catch ... finally to trap errors
- describe how screen prompts are used to provide information to a user about the actions that can be taken after an error

## **Outcome 3 Be able to test the operation of an object oriented driven program**

The learner can:

1. Make effective use of the debugging facilities available in the IDE
2. Prepare a test strategy
3. Select suitable test data and determine expected test results
4. Record actual test results to enable comparison with expected results
5. Analyse actual test results against expected results to identify discrepancies
6. Investigate test discrepancies to identify and rectify their causes

### **Additional guidance**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- explain the purpose of a test plan is, for each test to be performed, to identify the type of test, the test data required and the expected results of the test
- state that test data should contain valid and invalid data
- explain the purpose of a test log is to record the actual results of each test in the test plan, comment on any discrepancies between the actual results and the expected results and record if any amendments are made to correct an error
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

## **Outcome 4 Be able to document an object oriented driven program**

The learner can:

1. Create on-screen help to assist the users of a computer program
2. Create documentation for the support and maintenance of a computer program

### **Additional guidance**

The learner will be able to

- describe how screen prompts are used to provide information to a user about the actions that can be taken
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification, program listing, class interfaces, test plan and test results

**Level:** 3  
**Credit value:** 12  
**UAN:** F/601/3179

**Unit aim**

The aim of this unit is to teach the concepts of event driven programming, in order to do this the learner will learn some of the features of an event driven environment such as using standard input and output commands and use the integrated development environment effectively. The learner will also have an opportunity to use what they have learnt by modifying an existing program to improve its quality. They will test their amended costs against actual and expected outcomes.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to implement a software design using event driven programming
2. Be able to refine an event driven program to improve quality
3. Be able to test the operation of an event driven program
4. Be able to document an event driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

**Outcome 1 Be able to refine an event driven program to improve quality**

The learner can:

1. Identify the screen components and data and file structures required to implement a given design
2. Select, declare and initialise variable and data structure types and sizes to implement design requirements
3. Select and assign properties to screen components to implement design requirements
4. Select and associate events (including parameter passing) to screen components to implement design requirements
5. Implement event handling using control structures to meet the design algorithms
6. Select and declare file structures to meet design file storage requirements
7. Select and use standard input/output commands to implement design requirements
8. Make effective use of operators and predefined functions
9. Make effective use of an Integrated Development Environment (IDE) including code and screen templates

**Additional guidance**

The learner will be able to:

- explain the purpose and action of the following controls: CheckBox, ComboBox, , ListBox, PictureBox, TextBox
- describe the purpose of a bound control
- describe the features of a record structured database
- identify appropriate data types for the fields in a given record eg text, date, logical, numeric. currency
- state that a primary key is used to uniquely identify a record
- explain how the properties of bound controls can be set to enable access to database records
- describe arrays with a data type of integer or string
- explain the use of the Structure definition to create a user defined variable with two or more elements
- describe the properties: Cancel, Checked, Count, Cursor, DatabaseName, Image, Items, SelectedIndex, SelectedItem, SizeMode, Sorted, TabIndex, TabStop
- explain the purpose and use of the DataGrid control
- describe control structures used for selection ie If, If ... Else, Select Case
- describe control structures for loops ie For ... Next, Do While ... Loop, Do ... Loop While
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), = (equal to), <> (not equal to)
- describe the logical operators AND, OR, NOT
- describe the arithmetic operators ie + (add), - (subtract), \* (multiply), / (divide), MOD (modulus)
- describe the assignment operator =
- describe functions that can be used for concatenating and manipulating a string
- explain the use of the isNumeric, Val and StrComp functions

- explain how data from a database can be connected to bound controls on a form
- state the syntax and structure of basic SQL queries
- explain how an SQL query can be embedded in the code
- describe the objects, properties methods and events that are used to output data to a printer

## **Outcome 2 Be able to refine an object oriented program to improve quality**

The learner can:

1. Use an agreed standard for naming, comments and code layout
2. Define user functions to replace repeating code sequences
3. Implement data validation for inputs
4. Identify and implement opportunities for error handling and reporting

### **Additional guidance**

The learner will be able to:

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for forms, controls and variables
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- explain the use of Try, Catch and Finally in error trapping
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken after an error

## **Outcome 3 Be able to test the operation of an event driven program**

The learner can:

1. Make effective use of the debugging facilities available in the IDE
2. Prepare a test strategy
3. Select suitable test data and determine expected test results
4. Record actual test results to enable comparison with expected results
5. Analyse actual test results against expected results to identify discrepancies
6. Investigate test discrepancies to identify and rectify their causes

### **Additional guidance**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- explain the purpose of a test plan is, for each test to be performed, to identify the type of test, the test data required and the expected results of the test
- state that test data should contain valid and invalid data
- explain the purpose of a test log is to record the actual results of each test in the test plan, comment on any discrepancies between the actual results and the expected results and record if any amendments are made to correct an error

- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

#### **Outcome 4 Be able to document an event driven program**

The learner can:

1. Create on-screen help to assist the users of a computer program
2. Create documentation for the support and maintenance of a computer program

#### **Additional guidance**

The learner will be able to

- describe how screen prompts or tool tips are used to provide information to a user
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification program listing, test plan and test results

**Level:** 3  
**Credit value:** 12  
**UAN:** L/601/3184

**Unit aim**

This unit covers more advanced concepts of object oriented computer languages and their use to implement, refine and test computer programs.

The aim of this unit is to teach the concepts of object oriented programming, in order to this the learner will learn some of the key features of an object oriented environment. For example they will learn how to declare structures and use standard input and output commands. They will have an opportunity to use what they have learnt by refining an exiting program to improve its quality. The learner will test the amended program, comparing actual with expected results, and will learn to document a program and create a user guide.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to implement a software design using object oriented programming
2. Be able to refine an object oriented program to improve quality
3. Be able to test the operation of an object oriented driven program
4. Be able to document an object oriented driven program

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio or by means of a **set assignment** covering practical activities and underpinning knowledge.

# Unit 4520-325      Creating an object oriented computer program using C#

## Assessment Criteria

### Outcome 1      Be able to implement a software design using object oriented programming

The learner can:

1. Identify the objects and data and file structures required to implement a given design
2. Select, declare and initialise variable and data structure types and sizes to implement design requirements
3. Define relationships between objects to implement design requirements
4. Implement message passing between objects to implement design requirements
5. Implement object behaviours using control structures to meet the design algorithms
6. Select and declare file structures to meet design file storage requirements
7. Select and use standard input/output commands to implement design requirements
8. Make effective use of operators and predefined functions
9. Make effective use of an Integrated Development Environment (IDE) including code and screen templates

#### Additional guidance

The learner will be able to

- explain the purpose and action of the following controls: CheckBox, ComboBox, , ListBox, PictureBox, TextBox
- describe the purpose of a bound control
- describe the features of a record structured database
- identify appropriate data types for the fields in a given record eg text, date, logical, numeric. currency
- state that a primary key is used to uniquely identify a record
- explain how the properties of bound controls can be set to enable access to database records
- explain the use of the private and public qualifiers
- describe two-dimensional arrays with a data type of integer or string
- describe the properties: Checked, Count, Cursor, Image, Items, SelectedItem, SizeMode, Sorted, TabIndex, TabStop
- explain the purpose and use of the DataGridView control
- describe control structures used for selection ie If, If ... Else, Select Case
- describe control structures for loops ie For ... Next, Do While ... Loop, Do ... Loop While
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), = (equal to), <> (not equal to)
- describe the logical operators AND, OR, NOT
- describe the arithmetic operators ie + (add), - (subtract), \* (multiply), / (divide), MOD (modulus)
- describe the assignment operator =
- describe functions that can be used for concatenating and manipulating a string
- explain how data from a database can be connected to bound controls on a form
- state the syntax and structure of basic SQL queries
- explain how an SQL query can be embedded in the code

- describe the objects, properties methods and events that are used to output data to a printer

## **Outcome 2 Be able to refine an object oriented program to improve quality**

The learner can:

1. Use an agreed standard for naming, comments and code layout
2. Make effective use of encapsulation, polymorphism and inheritance
3. Implement data validation for inputs
4. Identify and implement opportunities for error handling and reporting

Additional guidance

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for forms, controls and variables
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- explain the use of try, catch and finally in error trapping
- describe how screen prompts are used to provide information to a user about the actions that can be taken after an error

## **Outcome 3 Be able to test the operation of an object oriented driven program**

The learner can:

1. Make effective use of the debugging facilities available in the IDE
2. Prepare a test strategy
3. Select suitable test data and determine expected test results
4. Record actual test results to enable comparison with expected results
5. Analyse actual test results against expected results to identify discrepancies
6. Investigate test discrepancies to identify and rectify their causes

**Additional guidance**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- explain the purpose of a test plan is, for each test to be performed, to identify the type of test, the test data required and the expected results of the test
- state that test data should contain valid and invalid data
- explain the purpose of a test log is to record the actual results of each test in the test plan, comment on any discrepancies between the actual results and the expected results and record if any amendments are made to correct an error
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

## **Outcome 4 Be able to document an object oriented driven program**

The learner can:

1. Create on-screen help to assist the users of a computer program
2. Create documentation for the support and maintenance of a computer program

### **Additional guidance**

The learner will be able to

- describe how screen prompts or tool tips are used to provide information to a user
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification, program listing, test plan and test results

**Level:** 3  
**Credit value:** 12  
**UAN:** T/500/6798

**Unit aim**

The aim of this unit is to teach the learner how to manage the development of software. In order to do this the learner will learn what the organisational requirements are that govern the development of software, such as internal styles and runtime environments. The learner will also learn to provide guidance on organisational requirements to their immediate colleagues.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Understand the technical aspects of the software development work of others
2. Be able to supervise the technical aspects of the software development work of others

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-326      Managing software development**

## Assessment Criteria

### **Outcome 1      Understand the technical aspects of the software development work of others**

The learner can:

1. Describe what organisational requirements to follow relating to:
  - form, content and structure of program designs;
  - style for internal documentation of software components;
  - conventions for naming of software components;
  - format, content and presentation of maintenance documentation
2. Describe the software development procedures to be followed including:
  - creating detailed designs, software components and documentation;
  - testing and installing software
  - creating outline designs;
  - specifying runtime environments

### **Outcome 2      Be able to supervise the technical aspects of the software development work of others**

The learner can:

1. Provide guidance on specified organisational requirements and procedures to immediate colleagues

**Level:** 3  
**Credit value:** 12  
**UAN:** T/500/7210

**Unit aim**

The aim of this unit is to teach the learner how understand the quality management of ICT products and services. In order to do this the learner will learn about the specified parts of organisational quality management procedures including, customer agreements, audit and inspection and customer feedback among others. The learner will also learn how to monitor any quality management procedures.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Understand specified organisational quality management procedures
2. Be able to monitor quality management procedures

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **100** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

## Assessment Criteria

**Outcome 1 Understand specified organisational quality management procedures**

The learner can:

1. Explain specified parts of organisational quality management procedures including:
  - customer agreements
  - activity planning
  - third-party monitoring
  - change control
  - work-in-progress
  - testing
  - defects and defective components
  - audit and inspection
  - customer feedback
  - communication

**Outcome 2 Understand specified organisational quality management procedures**

The learner can:

1. Monitor compliance with relevant parts of procedures by:
  - participating in audits of working practices and inspections of work
  - gathering and recording information on quality
  - initiating suitable actions to deal with identified failures in quality
2. Provide guidance to immediate colleagues on quality

**Level:** 3  
**Credit value:** 10  
**UAN:** A/602/1393

**Unit aim**

The aim of this unit is provide the underpinning knowledge required for the learner to sit the CompTIA Network + 2009 exam. As part of this unit the learner will learn how different network technologies function and operate. They will also learn to work with different media and topologies. They will learn how to manage various networks using different networking tools. The learner will explain the function of networking hardware and software in the security of ICT systems.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand network technologies
2. Understand network media and topologies
3. Understand network devices
4. Understand network management
5. Understand network tools
6. Understand network security

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant CompTIA test.

# Unit 4520-329      CompTIA Network + 2009

## Assessment Criteria

### **Outcome 1      Understand network technologies**

The learner can:

1. Explain the function of common networking protocols
2. Identify commonly used TCP and UDP default ports
3. Identify the following address formats
4. Given a scenario, evaluate the proper use of the following addressing technologies and addressing schemes
5. Identify common IPv4 and IPv6 routing protocols
6. Explain the purpose and properties of routing
7. Compare the characteristics of wireless communication standards

### **Outcome 2      Understand network media and topologies**

The learner can:

1. Categorize standard cable types and their properties
2. Identify common connector types
3. Identify common physical network topologies
4. Given a scenario, differentiate and implement appropriate wiring standards
5. Categorize WAN technology types and properties
6. Categorize LAN technology types and properties
7. Explain common logical network topologies and their characteristics
8. Install components of wiring distribution

### **Outcome 3      Understand network devices**

The learner can:

1. Install, configure and differentiate between common network devices
2. Identify the functions of specialized network devices
3. Explain the advanced features of a switch
4. Implement a basic wireless network

### **Outcome 4      Understand network management**

The learner can:

1. Explain the function of each layer of the OSI model
2. Identify types of configuration management documentation
3. Given a scenario, evaluate the network based on configuration management documentation
4. Conduct network monitoring to identify performance and connectivity issues
5. Explain different methods and rationales for network performance optimization
6. Given a scenario, implement the appropriate network troubleshooting methodology
7. Given a scenario, troubleshoot common connectivity issues and select an appropriate solution

### **Outcome 5      Understand network tools**

The learner can:

1. Given a scenario, select the appropriate command line interface tool and interpret the output to verify functionality
2. Explain the purpose of network scanners
3. Given a scenario, utilize the appropriate hardware tools

## **Outcome 6 Understand network security**

The learner can:

1. Explain the function of hardware and software security devices
2. Explain common features of a firewall
3. Explain the methods of network access security
4. Explain methods of user authentication
5. Explain issues that affect device security
6. Identify common security threats and mitigation techniques

**Level:** 3  
**Credit value:** 10  
**UAN:** L/602/1396

**Unit aim**

The aim of this unit is provide the underpinning knowledge required for a learner to sit the CompTIA Security+ exam. As part of that the learner will learn to understand the various aspects of systems security, from general system security right through to organisational security policies and procedures. This unit will also give the learner the opportunity to understand the principles surrounding cryptography.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand systems security
2. Understand network infrastructure
3. Understand access control
4. Understand assessments & audits
5. Understand cryptography
6. Understand organizational security

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant CompTIA test.

# Unit 4520-330      CompTIA Security+ 2008

## Assessment Criteria

### **Outcome 1    Understand systems security**

The learner can:

1. Differentiate among various systems security threats
2. Explain the security risks pertaining to system hardware and peripherals
3. Implement OS hardening practices and procedures to achieve workstation and server security
4. Carry out the appropriate procedures to establish application security
5. Implement security applications
6. Explain the purpose and application of virtualization technology

### **Outcome 2    Understand network infrastructure**

The learner can:

1. Differentiate between the different ports & protocols, their respective threats and mitigation techniques
2. Distinguish between network design elements and components
3. Determine the appropriate use of network security tools to facilitate network security
4. Apply the appropriate network tools to facilitate network security
5. Explain the vulnerabilities and mitigations associated with network devices
6. Explain the vulnerabilities and mitigations associated with various transmission media
7. Explain the vulnerabilities and implement mitigations associated with wireless networking

### **Outcome 3    Understand access control**

The learner can:

1. Identify and apply industry best practices for access control methods
2. Explain common access control models and the differences between each
3. Organize users and computers into appropriate security groups and roles while distinguishing between appropriate rights and privileges.
4. Apply appropriate security controls to file and print resources
5. Compare and implement logical access control methods
6. Summarize the various authentication models and identify the components of each.
7. Deploy various authentication models and identify the components of each
8. Explain the difference between identification and authentication (identity proofing)
9. Explain and apply physical access security methods

### **Outcome 4    Understand assessments & audits**

The learner can:

1. Conduct risk assessments and implement risk mitigation
2. Carry out vulnerability assessments using common tools
3. Within the realm of vulnerability assessments, explain the proper use of penetration testing versus vulnerability scanning
4. Use monitoring tools on systems and networks and detect security-related anomalies.
5. Compare and contrast various types of monitoring methodologies
6. Execute proper logging procedures and evaluate the results
7. Conduct periodic audits of system security settings

## **Outcome 5 Understand cryptography**

The learner can:

1. Explain general cryptography concepts
2. Explain basic hashing concepts and map various algorithms to appropriate applications
3. Explain basic encryption concepts and map various algorithms to appropriate applications
4. Explain and implement protocols
5. Explain core concepts of public key cryptography
6. Implement PKI and certificate management

## **Outcome 6 Understand organizational security**

The learner can:

1. Explain redundancy planning and its components
2. Implement disaster recovery procedures
3. Differentiate between and execute appropriate incident response procedures
4. Identify and explain applicable legislation and organizational policies
5. Explain the importance of environmental controls
6. Explain the concept of and how to reduce the risks of social engineering

**Level:** 3  
**Credit value:** 10  
**UAN:** R/602/1397

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the CompTIA Server+ 2009 exam. In order to do this the learner will learn to understand different server hardware and software. They will learn to understand the different storage options that are available on server networks. The learner will also explore the environments in which servers are used. Learners will also understand the principles of disaster recovery.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand system hardware
2. Understand software
3. Understand storage
4. Understand the IT environment
5. Understand disaster recovery
6. Understand troubleshooting

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant CompTIA test.

# Unit 4520-331      CompTIA Server+ 2009

## Assessment Criteria

### **Outcome 1    Understand system hardware**

The learner can:

1. Differentiate between system board types, features, components and their purposes
2. Deploy different chassis types and the appropriate components
3. Differentiate between memory features / types and given a scenario select appropriate memory
4. Explain the importance of a Hardware Compatibility List (HCL)
5. Differentiate between processor features / types and given a scenario select the appropriate processor
6. Given a scenario, install appropriate expansion cards into a server while taking fault tolerance into consideration
7. Install, update and configure appropriate firmware

### **Outcome 2    Understand software**

The learner can:

1. Install, deploy, configure and update NOS (Windows / \*nix)
2. Explain NOS security software and its features
3. Given a scenario, implement and administer NOS management features based on procedures and guidelines
4. Explain different server roles, their purpose and how they interact
5. Summarize server virtualization concepts, features and considerations
6. Describe common elements of networking essentials

### **Outcome 3    Understand storage**

The learner can:

1. Describe RAID technologies and its features and benefits
2. Given a scenario, select the appropriate RAID level
3. Install and configure different internal storage technologies
4. Summarize the purpose of external storage technologies

### **Outcome 4    Understand the IT environment**

The learner can:

1. Write, utilize and maintain documentation, diagrams and procedures
2. Given a scenario, explain the purpose of the following industry best practices
3. Determine an appropriate physical environment for the server location
4. Implement and configure different methods of server access
5. Given a scenario, classify physical security measures for a server location

### **Outcome 5    Understand disaster recovery**

The learner can:

1. Compare and contrast backup and restoration methodologies, media types and concepts
2. Given a scenario, compare and contrast the different types of replication methods
3. Explain data retention and destruction concepts
4. Given a scenario, carry out the following basic steps of a disaster recovery plan

## **Outcome 6 Understand troubleshooting**

The learner can:

1. Explain troubleshooting theory and methodologies
2. Given a scenario, effectively troubleshoot hardware problems, selecting the appropriate tools and methods
3. Given a scenario, effectively troubleshoot software problems, selecting the appropriate tools and methods
4. Given a scenario, effectively diagnose network problems, selecting the appropriate tools and methods
5. Given a scenario, effectively troubleshoot storage problems, selecting the appropriate tools and methods

**Level:** 3  
**Credit value:** 10  
**UAN:** F/601/7457

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for the learner to sit the Cisco IT Essentials Part 2 exam. In order to do this the learner will learn to define a range of computer components and elements of the troubleshooting process. They will also learn to evaluate and upgrade security components in an operating system. Lastly the learner will learn to maintain a computer network.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand the principles managing computer systems
2. Be able to manage the support of operating systems and security requirements
3. Be able to maintain networked system

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related course Cisco IT Essentials test (Final for chapter 11-16)

## **Unit 4520-332 Cisco IT Essentials Part 2**

### Assessment Criteria

#### **Outcome 1 Understand the principles managing computer systems**

The learner can:

1. Define information technology and describe the components of a range of computer systems
2. Evaluate the purpose of preventive maintenance and identify the elements of the troubleshooting process
3. Manage good communication skills and professional behaviour while working with customers
4. Plan and implement advanced installation of a desk top computer tower; select components based on customer needs and perform preventive maintenance and troubleshooting

#### **Outcome 2 Be able to manage the support of operating systems and security requirements**

The learner can:

1. Evaluate and Upgrade advanced security components based on customer needs and perform preventive maintenance and troubleshooting
2. Explain, install, and support a range of operating systems; upgrade components based on organizational needs and perform preventive maintenance and troubleshooting

#### **Outcome 3 Be able to maintain networked system**

The learner can:

1. Plan and install a networked system; upgrade components based on customer needs and perform preventive maintenance and troubleshooting

**Level:** 3  
**Credit value:** 10  
**UAN:** K/601/7422

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Cisco Exploration Accessing the WAN exam. In order to do this the learner will learn how to implement a wide area network, whilst configuring the various protocols and services associated with a WAN. They will also learn how to test and troubleshoot a WAN configuration. The learner will learn how to plan an implement security on a WAN and will learn to evaluate a WAN and implement security and network address management technologies as a whole.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to implement a WAN
2. Be able to test and troubleshoot a WAN implementation
3. Be able to plan security for a WAN
4. Know how to evaluate a WAN and implement security and network address management technologies

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related course Cisco test

# Unit 4520-333 Cisco Exploration Accessing the WAN

## Assessment Criteria

### **Outcome 1 Be able to implement a WAN**

The learner can:

1. Describe the impact of Voice Over IP and Video Over IP applications on a network
2. Identify and correct common network problems at layers 1, 2, 3, and 7 using a layered model approach
3. Interpret network diagrams
4. Describe the components required for network and Internet communications)
5. Explain the operation and benefits of DHCP and DNS
6. Configure, verify, and troubleshoot DHCP and DNS operations on a router
7. Describe current network security threats and explain how to implement a comprehensive security policy to mitigate common threats to network devices, hosts, and applications
8. Describe the functions of common security appliances and applications
9. Describe recommended security practices to secure network devices
10. Explain the basic operation of Network Address Translation (NAT)
11. Configure NAT for given network requirements using SDM/CLI
12. Describe different methods for connecting to a WAN
13. Configure and verify a basic WAN serial connection
14. Configure and verify a Point-to-Point Protocol (PPP) connection between Cisco routers
15. Configure and verify Frame Relay on Cisco routers

### **Outcome 2 Be able to test and troubleshoot a WAN implementation**

The learner can:

1. Troubleshoot WAN implementation issues
2. Troubleshoot NAT issues

### **Outcome 3 Be able to plan security for a WAN**

The learner can:

1. Implement basic switch security measures such as port security, trunk access, and management VLANs
2. Describe the purpose and types of access control lists (ACLs)
3. Configure and apply ACLs based on network filtering requirements
4. Configure and apply an ACLs to limit Telnet and SSH access to the router using the Security Device Manager command-line interface (SDM/CLI)

### **Outcome 4 Know how to evaluate a WAN and implement security and network address management technologies**

The learner can:

1. Describe the importance, benefits, role, impact, and components of VPN technology
2. Verify, monitor, and troubleshoot ACLs in a network environment

**Level:** 3  
**Credit value:** 10  
**UAN:** K/601/7453

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Cisco Exploration Accessing the LAN switching and wireless exam. In order to do this the learner will learn how to configure a switched and trunked VLAN infrastructure, through exploring its associated concepts and principles. The learner will also learn to test and troubleshoot a VLAN infrastructure. They will learn to enable a VLAN trunk protocol to operate and manage a LAN and will learn to understand the operation of wireless systems.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to configure a switched and trunked VLAN infrastructure
2. Be able to test and troubleshoot a VLAN infrastructure
3. Be able to enable a VLAN Trunk Protocol (VTP) client/server structure to operate and manage a LAN
4. Understand the operation of wireless systems

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related course Cisco test

# Unit 4520-334 Cisco Exploration LAN Switching and Wireless

## Assessment Criteria

### **Outcome 1 Be able to configure a switched and trunked VLAN infrastructure**

The learner can:

1. Identify and correct common network problems at layers 1, 2, 3, and 7 using a layered model approach
2. Interpret network diagrams
3. Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts
4. Explain the technology and media access control method for Ethernet networks
5. Explain basic switching concepts and the operation of Cisco switches
6. Perform and verify initial switch configuration tasks including remote access management
7. Describe how VLANs create logically separate networks and how routing occurs between them
8. Manage Cisco IOS® Software
9. Manage Cisco IOS configuration files (save, edit, upgrade, and restore)

### **Outcome 2 Be able to test and troubleshoot a VLAN infrastructure**

The learner can:

1. Configure, verify, and troubleshoot VLANs, trunking on Cisco switches, interVLAN routing, VTP, and RSTP
2. Identify, prescribe, and resolve common switched network media issues, configuration issues, autonegotiation, and switch hardware failures
3. Interpret the output of various show and debug commands to verify the operational status of a Cisco switched network
4. Verify network status and switch operation using basic utilities such as ping, traceroute, Telnet, Secure Shell (SSH), Address Resolution Protocol (ARP), and ipconfig, as well as the show and debug commands

### **Outcome 3 Be able to enable a VLAN Trunk Protocol (VTP) client/server structure to operate and manage a LAN**

The learner can:

1. Describe enhanced switching technologies such as VLANs, VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Protocol (PVSTP), and

### **Outcome 4 Understand the operation of wireless systems**

The learner can:

1. Describe standards associated with wireless media, such as IEEE WI-FI Alliance and ITU/FCC
2. Identify and describe the purpose of the components in a small wireless network, such as Service Set Identification (SSID), Basic Service Set (BSS), and Extended Service Set (ESS)
3. Identify basic configuration parameters on a wireless network to ensure that devices connect to the correct access points
4. Compare and contrast Wi-Fi Protected Access (WPA) security features and capabilities of open, Wired Equivalent Privacy (WEP), and WPA-1/2 networks
5. Describe common wireless-network implementation issues such as interference and misconfiguration

**Level:** 3  
**Credit value:** 10  
**UAN:** A/601/7537

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Cisco Exploration Network Fundamentals exam. In order to do this the learner will learn the diverse types of network systems and devices in use. The learner will also learn how to use different network technologies and to understand the OSI model and TCP/IP protocol. The learner will be able to configure a workstation so that it can connect to a network and they will be able to design a sub-network scheme.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Know the diverse types of network systems and devices in common use
2. Know how different network technologies operate and communicate
3. Understand OSI and TCP/IP and their relationship to the operation of network systems
4. Be able to configure a workstation for connection to a network
5. Be able to design a sub-network scheme
6. Be able to recommend improvements to an existing network infrastructure

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related course Cisco test

# Unit 4520-335 Cisco Exploration Network Fundamentals

## Assessment Criteria

### **Outcome 1 Know the diverse types of network systems and devices in common use**

The learner can:

1. Explain the importance of data networks and the Internet in supporting business communications and everyday activities
2. Explain how communication works in data networks and the Internet
3. Recognize the devices and services that are used to support communications across an Internetwork
4. Describe the importance of addressing and naming schemes at various layers of data networks
5. Explain fundamental Ethernet concepts such as media, services, and operation

### **Outcome 2 Know how different network technologies operate and communicate**

The learner can:

1. Use network protocol models to explain the layers of communications in data networks
2. Explain the role of protocols in data networks

### **Outcome 3 Understand OSI and TCP/IP and their relationship to the operation of network systems**

The learner can:

1. Describe the protocols and services provided by the application layer in the OSI and TCP/IP models and describe how this layer operates in various networks
2. Analyze the operations and features of transport layer protocols and services
3. Analyze the operations and feature of network layer protocols and services and explain the fundamental concepts of routing
4. Describe the operation of protocols at the OSI data link layer and explain how they support communications
5. Explain the role of physical layer protocols and services in supporting communications across data networks
6. Analyse the operations and features of common application layer protocols such as HTTP, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), Simple Mail Transfer Protocol (SMTP), Telnet, and FTP

### **Outcome 4 Be able to configure a workstation for connection to a network**

The learner can:

1. Use Cisco command-line interface (CLI) commands to perform basic router and switch configuration and verification
2. Build a simple Ethernet network using routers and switches
3. Employ basic cabling and network designs to connect devices in accordance with stated objectives

### **Outcome 5 Be able to design a sub-network scheme**

The learner can:

1. Design, calculate, and apply subnet masks and addresses to fulfill given requirements

### **Outcome 6 Be able to recommend improvements to an existing network infrastructure**

The learner can:

1. Verify small network operations and analyze data traffic

**Level:** 3  
**Credit value:** 10  
**UAN:** H/601/7421

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Cisco Exploration Routing Protocols and Concepts exam. In order to do this the learner will learn to identify and understanding different routing protocols. They will learn to understand a wide range of protocols and will also learn to configure a router to communicate with a WAN infrastructure. The learner will learn to troubleshoot a network system identifying faults and monitoring the quality of communications.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to identify and understand different routing protocols
2. Be able to configure a router to communicate with a WAN infrastructure
3. Be able to test and troubleshoot a network system to identify faults and quality of communication

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related course Cisco test

**Assessment Criteria****Outcome 1 Be able to identify and understand different routing protocols**

The learner can:

1. Describe the purpose, nature, and operations of a router
2. Explain the critical role routers play in enabling communications across multiple networks
3. Describe the purpose and nature of routing tables
4. Describe how a router determines a path and switches packets
5. Explain the route lookup process and determine the path packets will take in a network
6. Describe the purpose of static routes and the procedure for configuring them
7. Describe the role of dynamic routing protocols and place these protocols in the context of modern network design
8. Describe how metrics are used by routing protocols and identify the metric types used by dynamic routing protocols
9. Identify the characteristics of distance vector routing protocols
10. Describe the network discovery process of distance vector routing protocols using Routing Information Protocol (RIP)
11. Describe the functions, characteristics, and operations of the RIPv1 protocol
12. Compare and contrast classful and classless IP addressing
13. Describe classful and classless routing behaviors in routed networks
14. Design and implement a classless IP addressing scheme for a given network
15. Describe the main features and operations of the Enhanced Interior Gateway Routing Protocol (EIGRP)
16. Describe the basic features and concepts of link-state routing protocols
17. Describe the purpose, nature, and operations of the Open Shortest Path First (OSPF) Protocol

**Outcome 2 Be able to configure a router to communicate with a WAN infrastructure**

The learner can:

1. Configure and verify basic operations for a newly-installed router
2. Configure and verify basic RIPv1, RIPv2, single area OSPF, and EIGRP operations in a small routed network
3. Use advanced configuration commands with routers implementing EIGRP and OSPF
4. Configure and verify basic operations for a newly-installed router
5. Configure and verify static and default routing

**Outcome 3 Be able to test and troubleshoot a network system to identify faults and quality of communication**

The learner can:

1. Use router show and debug commands to troubleshoot common errors that occur in small routed networks

**Level:** 3  
**Credit value:** 12  
**UAN:** J/502/3556

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Configuring Microsoft Exchange Server 2007 exam. In order to do this the learner will learn how to install and configure a Microsoft Exchange server, configure its various roles and will learn to configure recipients and public folders. The learner will also learn to configure an Exchange infrastructure and will plan and configure for disaster recovery.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to install and configure Microsoft Exchange servers
2. Be able to configure recipients and public folders
3. Be able to configure the exchange infrastructure
4. Be able to monitor and report
5. Be able to configure disaster recovery

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by using the relevant Microsoft test.

**Assessment Criteria****Outcome 1 Be able to install and configure Microsoft Exchange servers**

The learner can:

1. Prepare the infrastructure for Exchange installation
2. Prepare the servers for Exchange installation
3. Install Exchange
4. Configure Exchange server roles

**Outcome 2 Be able to configure recipients and public folders**

The learner can:

1. Configure recipients
2. Configure mail-enabled groups
3. Configure resource mailboxes
4. Configure public folders
5. Move mailboxes
6. Implement bulk management of mail-enabled objects

**Outcome 3 Be able to configure the exchange infrastructure**

The learner can:

1. Configure connectors
2. Configure the antivirus and anti-spam system
3. Configure transport rules and message compliance
4. Configure policies
5. Configure public folders
6. Configure client connectivity

**Outcome 4 Be able to monitor and report**

The learner can:

1. Monitor mail queues
2. Monitor system performance
3. Perform message tracking
4. Monitor client connectivity
5. Create server reports
6. Create usage reports

**Outcome 5 Be able to configure disaster recovery**

The learner can:

1. Configure backups
2. Recover messaging data
3. Recover server roles
4. Configure high availability

**Level:** 3  
**Credit value:** 7  
**UAN:** A/501/2604

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Microsoft Installing, Configuring and Administering MS Windows XP Professional examination 70-270. In order to do this the learner will learn to install Windows XP Professional XP and configure different features as they are needed. The learner will also learn to troubleshoot and monitor the installation of any third party software.

**Learning outcomes**

There are **seven** learning outcomes to this unit. The learner will:

1. Be able to install Windows XP Professional
2. Be able to implement and conduct administration of resources
3. Be able to implement, manage, monitor, and troubleshoot hardware devices and drivers
4. Be able to monitor and optimize system performance and reliability
5. Be able to configure and troubleshoot the desktop environment
6. Be able to implement, manage, and troubleshoot network protocols and services
7. Be able to configure, manage and troubleshoot security

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **65** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-338      Installing, Configuring and Administering MS Windows XP Professional

## Assessment Criteria

### **Outcome 1    Be able to install Windows XP Professional**

The learner can:

1. Perform and troubleshoot an attended installation of Windows XP Professional
2. Perform and troubleshoot an unattended installation of Windows XP Professional
  - Install Windows XP Professional by using Remote Installation Services (RIS)
  - Install Windows XP Professional by using the System Preparation Tool
  - Create unattended answer files by using Setup Manager to automate the installation of Windows XP Professional
3. Upgrade from a previous version of Windows to Windows XP Professional
  - Prepare a computer to meet upgrade requirements
  - Migrate existing user environments to a new installation
4. Perform post-installation updates and product activation
5. Troubleshoot failed installations

### **Outcome 2    Be able to implement and conduct administration of resources**

The learner can:

1. Monitor, manage, and troubleshoot access to files and folders
  - Configure, manage, and troubleshoot file compression
  - Control access to files and folders by using permissions
  - Optimize access to files and folders
2. Perform and troubleshoot an unattended installation of Windows XP Professional
  - Create and remove shared folders
  - Control access to shared folders by using permissions
  - Manage and troubleshoot Web server resources
3. Connect to local and network print devices
  - Manage printers and print jobs
  - Control access to printers by using permissions
  - Connect to an Internet printer
  - Connect to a local print device
4. Configure and manage file systems
  - Convert from one file system to another file system
  - Configure NTFS, FAT32, or FAT file systems
5. Manage and troubleshoot access to and synchronization of offline files

### **Outcome 3 Be able to implement, manage, monitor, and troubleshoot hardware devices and drivers**

The learner can:

1. Implement, manage, and troubleshoot disk devices
  - Install, configure, and manage DVD and CD-ROM devices
  - Monitor and configure disks
  - Monitor, configure, and troubleshoot volumes
  - Monitor and configure removable media, such as tape devices
2. Implement, manage, and troubleshoot display devices
  - Configure multiple-display support
  - Install, configure, and troubleshoot a video adapter
3. Configure Advanced Configuration Power Interface (ACPI)
4. Implement, manage, and troubleshoot input and output (I/O) devices
  - Monitor, configure, and troubleshoot I/O devices, such as printers, scanners, multimedia devices, mouse, keyboard, and smart card reader
  - Monitor, configure, and troubleshoot multimedia hardware, such as cameras
  - Install, configure, and manage modems
  - Install, configure, and manage Infrared Data Association (IrDA) devices
  - Install, configure, and manage wireless devices
  - Install, configure, and manage USB devices
  - Install, configure, and manage hand held devices
  - Install, configure, and manage network adapters
5. Manage and troubleshoot drivers and driver signing
6. Monitor and configure multiprocessor computers

### **Outcome 4 Be able to monitor and optimize system performance and reliability**

The learner can:

1. Monitor, optimize, and troubleshoot performance of the Windows XP Professional desktop
  - Optimize and troubleshoot memory performance
  - Optimize and troubleshoot processor utilization
  - Optimize and troubleshoot disk performance
  - Optimize and troubleshoot application performance
  - Configure, manage, and troubleshoot Scheduled Tasks
2. Manage, monitor, and optimize system performance for mobile users
3. Restore and back up the operating system, System State data, and user data
  - Recover System State data and user data by using Windows Backup
  - Troubleshoot system restoration by starting in safe mode
  - Recover System State data and user data by using the Recovery console

## **Outcome 5 Be able to configure and troubleshoot the desktop environment**

The learner can:

1. Configure and manage user profiles and desktop settings
2. Configure support for multiple languages or multiple locations
  - Enable multiple-language support
  - Configure multiple-language support for users
  - Configure local settings
  - Configure Windows XP Professional for multiple locations
3. Manage applications by using Windows Installer packages

## **Outcome 6 Be able to implement, manage, and troubleshoot network protocols and services**

The learner can:

1. Configure and troubleshoot the TCP/IP protocol
2. Connect to computers by using dial-up networking
  - Connect to computers by using a virtual private network (VPN) connection
  - Create a dial-up connection to connect to a remote access server
  - Connect to the Internet by using dial-up networking
  - Configure and troubleshoot Internet Connection Sharing (ICS)
3. Connect to resources by using Internet Explorer
4. Configure, manage, and implement Internet Information Services (IIS)
5. Configure, manage, and troubleshoot Remote Desktop and Remote Assistance
6. Configure, manage, and troubleshoot an Internet Connection Firewall (ICF)

## **Outcome 7 Be able to configure, manage and troubleshoot security**

The learner can:

1. Configure, manage, and troubleshoot Encrypting File System (EFS)
2. Configure, manage, and troubleshoot a security configuration and local security policy
3. Configure, manage, and troubleshoot local user and group accounts
  - Configure, manage, and troubleshoot auditing
  - Configure, manage, and troubleshoot account settings
  - Configure, manage, and troubleshoot account policy
  - Configure, manage, and troubleshoot user and group rights
  - Troubleshoot cache credentials

**Level:** 3  
**Credit value:** 7  
**UAN:** T/501/2827

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Implementing and Managing Microsoft Exchange Server 2003 exam. In order to do this the learner will learn to install, configure and troubleshoot an installation of Exchange server 2003. Once an installation is complete the learner will learn to manage that installation monitoring the health of the server. They will also learn to manage the organisation and security of an Exchange server 2003 installation.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to install, configure, and troubleshoot Exchange Server 2003
2. Be able to manage, monitor, and troubleshoot Exchange Server Computers
3. Be able to manage, monitor, and troubleshoot the Exchange Organisation
4. Be able to manage security in the Exchange Environment
5. Be able to manage and monitor technologies that support Exchange Server 2003

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **65** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by using the relevant Microsoft test.

# **Unit 4520-339      Implementing and Managing Microsoft Exchange Server 2003**

## Assessment Criteria

### **Outcome 1      Be able to install, configure, and troubleshoot Exchange Server 2003**

The learner can:

1. Prepare the environment for deployment of Exchange Server 2003
2. Install, configure, and troubleshoot Exchange Server 2003
3. Install, configure, and troubleshoot Exchange Server 2003 in a clustered environment
4. Upgrade from Exchange Server

### **Outcome 2      Be able to manage, monitor, and troubleshoot Exchange Server Computers**

The learner can:

1. Manage, monitor, and troubleshoot server health
2. Manage, monitor, and troubleshoot data storage
3. Manage, monitor, and troubleshoot Exchange Server clusters
4. Perform and troubleshoot backups and recovery
5. Remove an Exchange Server computer from the organization

### **Outcome 3      Be able to manage, monitor, and troubleshoot the Exchange Organisation**

The learner can:

1. Manage and troubleshoot public folders
2. Manage and troubleshoot virtual servers.
3. Manage and troubleshoot front-end and back-end servers)
4. Manage and troubleshoot connectivity
5. Monitor, manage, and troubleshoot infrastructure performance

### **Outcome 4      Be able to manage security in the Exchange Environment**

The learner can:

1. Manage and troubleshoot connectivity across firewalls
2. Manage audit settings and audit logs
3. Manage and troubleshoot permissions
4. Manage and troubleshoot encryption and digital signatures
5. Detect and respond to security threats

### **Outcome 5      Be able to manage and monitor technologies that support Exchange Server 2003**

The learner can:

1. Diagnose problems arising from host resolution protocols
2. Diagnose problems arising from Active Directory issues
3. Diagnose network connectivity problems

**Level:** 3  
**Credit value:** 7  
**UAN:** J/501/2606

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Managing and Maintaining a Windows Server 2003 Environment exam. In order to do this the learner will learn to manage and maintain physical and logical devices associated with the installation. They will learn to manage users and groups using the features of the server and will learn to monitor and report on the performance of the server environment. The learner will also learn to configure disaster recovery options.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to manage and maintain physical and logical devices
2. Be able to manage users, computers, and groups
3. Be able to manage and maintain access to Resources
4. Be able to manage and maintain a server environment
5. Be able to manage and implement disaster recovery

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **65** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-340      Managing and Maintaining a Windows Server 2003 Environment

## Assessment Criteria

### **Outcome 1    Be able to manage and maintain physical and logical devices**

The learner can:

1. Manage basic disks and dynamic disks
2. Monitor server hardware. Tools might include Device Manager, the Hardware Troubleshooting Wizard, and appropriate Control Panel items
3. Optimize server disk performance
  - Implement a RAID solution
  - Defragment volumes and partitions
4. Troubleshoot server hardware devices
  - Diagnose and resolve issues related to hardware settings
  - Diagnose and resolve issues related to server hardware and hardware driver upgrades
5. Install and configure server hardware devices
  - Configure driver signing options
  - Configure resource settings for a device
  - Configure device properties and settings

### **Outcome 2    Be able to manage users, computers, and groups**

The learner can:

1. Manage local, roaming, and mandatory user profiles
2. Create and manage computer accounts in an Active Directory environment
3. Create and manage groups
  - Identify and modify the scope of a group
  - Find domain groups in which a user is a member
  - Manage group membership
  - Create and modify groups by using the Active Directory Users and Computers Microsoft Management Console (MMC) snap-in
  - Create and modify groups by using automation
4. Create and manage user accounts
  - Create and modify user accounts by using the Active Directory Users and Computers MMC snap-in
  - Create and modify user accounts by using automation
  - Import user accounts
5. Troubleshoot computer accounts
  - Diagnose and resolve issues related to computer accounts by using the Active Directory Users and Computers MMC snap-in
  - Reset computer accounts
6. Troubleshoot user accounts
  - Diagnose and resolve account lockouts
  - Diagnose and resolve issues related to user account properties
7. Troubleshoot user authentication issues

### **Outcome 3 Be able to manage and maintain access to Resources**

The learner can:

1. Configure access to shared folders
  - Manage shared folder permissions
2. Troubleshoot Terminal Services
  - Diagnose and resolve issues related to Terminal Services security
  - Diagnose and resolve issues related to client access to Terminal Services
3. Configure file system permissions
  - Verify effective permissions when granting permissions
  - Change ownership of files and folders
4. Troubleshoot access to files and shared folders

### **Outcome 4 Be able to manage and maintain a server environment**

The learner can:

1. Monitor and analyze events. Tools might include Event Viewer and System Monitor
2. Manage software update infrastructure
3. Manage software site licensing
4. Manage servers remotely
  - Manage a server by using Remote Assistance
  - Manage a server by using Terminal Services remote administration mode
  - Manage a server by using available support tools
5. Troubleshoot print queues
6. Monitor system performance
7. Monitor file and print servers. Tools might include Task Manager, Event Viewer, and System Monitor
  - Monitor disk quotas
  - Monitor print queues
  - Monitor server hardware for bottlenecks
8. Monitor and optimize a server environment for application performance
  - Monitor memory performance objects
  - Monitor network performance objects
  - Monitor process performance objects
  - Monitor disk performance objects
9. Manage a Web server
  - Manage Internet Information Services (IIS).
  - Manage security for IIS

### **Outcome 5 Be able to manage and implement disaster recovery**

The learner can:

1. Perform system recovery for a server
  - Implement Automated System Recovery (ASR)
  - Restore data from shadow copy volumes
  - Back up files and System State data to media
  - Configure security for backup operations
2. Manage backup procedures
  - Verify the successful completion of backup jobs
  - Manage backup storage media
3. Recover from server hardware failure
4. Restore backup data
5. Schedule backup jobs

**Level:** 3  
**Credit value:** 10  
**UAN:** H/501/2824

**Unit aim**

The aim of this unit is to teach the learner how to implement and manage a Windows server 2003 infrastructure. In order to do this the learner will learn to manage and maintain IP addressing. They will also learn to manage name resolution using the features of the server, how to monitor and report on the performance of the server environment, and its security, and they will learn to implement, manage and maintain routing and remote access to the server.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to implement, manage and maintain IP addressing
2. Be able to implement, manage, and maintain name resolution
3. Be able to implement, manage, and maintain network security
4. Be able to implement, manage, and maintain routing and remote access
5. Be able to maintain a network infrastructure

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-341      Implementing, managing and maintaining a Windows Server 2003 network infrastructure**

## Assessment Criteria

### **Outcome 1      Be able to implement, manage and maintain IP addressing**

The learner can:

1. Configure TCP/IP addressing on a server computer
2. Manage DHCP
  - Manage DHCP clients and leases
  - Manage DHCP Relay Agent
  - Manage DHCP databases
  - Manage DHCP scope options
  - Manage reservations and reserved clients
3. Troubleshoot TCP/IP addressing
  - Diagnose and resolve issues related to Automatic Private IP Addressing (APIPA).
  - Diagnose and resolve issues related to incorrect TCP/IP configuration
4. Troubleshoot DHCP
  - Diagnose and resolve issues related to DHCP authorization
  - Verify DHCP reservation configuration
  - Examine the system event log and DHCP server audit log files to find related events
  - Diagnose and resolve issues related to configuration of DHCP server and scope options
  - Verify that the DHCP Relay Agent is working correctly
  - Verify database integrity

### **Outcome 2      Be able to implement, manage, and maintain name resolution**

The learner can:

1. Install and configure the DNS Server service
  - Configure DNS server options
  - Configure DNS zone options
  - Configure DNS forwarding
2. Manage DNS
  - Manage DNS zone settings
  - Manage DNS record settings
  - Manage DNS server options
3. Monitor DNS. Tools might include System Monitor, Event Viewer, Replication Monitor, and DNS debug logs

### **Outcome 3 Be able to implement, manage, and maintain network security**

The learner can:

1. Implement secure network administration procedures
  - Implement security baseline settings and audit security settings by using security templates
  - Implement the principle of least privilege
2. Install and configure software update infrastructure
  - Install and configure software update services
  - Install and configure automatic client update settings
  - Configure software updates on earlier operating systems
3. Monitor network protocol security. Tools might include the IP Security Monitor
4. Microsoft Management Console (MMC) snap-in and Kerberos support tools
5. Troubleshoot network protocol security. Tools might include the IP Security Monitoring
6. MMC snap-in, Event Viewer, and Network Monitor

### **Outcome 4 Be able to implement, manage, and maintain routing and remote access**

The learner can:

1. Configure Routing and Remote Access user authentication
  - Configure remote access authentication protocols
  - Configure Internet Authentication Service (IAS) to provide authentication for Routing and Remote Access clients
  - Configure Routing and Remote Access policies to permit or deny access
2. Manage remote access
  - Manage packet filters
  - Manage Routing and Remote Access routing interfaces
  - Manage devices and ports
  - Manage routing protocols
  - Manage Routing and Remote Access clients
3. Manage TCP/IP routing
  - Manage routing protocols
  - Manage routing tables
  - Manage routing ports
4. Implement secure access between private networks
5. Troubleshoot user access to remote access services
  - Diagnose and resolve issues related to remote access VPNs
  - Diagnose and resolve issues related to establishing a remote access connection
  - Diagnose and resolve user access to resources beyond the remote access server
6. Troubleshoot Routing and Remote Access routing
  - Troubleshoot demand-dial routing
  - Troubleshoot router-to-router VPNs

### **Outcome 5 Be able to maintain a network infrastructure**

The learner can:

1. Monitor network traffic. Tools might include Network Monitor and System Monitor
2. Troubleshoot connectivity to the Internet
3. Troubleshoot server services
  - Diagnose and resolve issues related to service dependency
  - Use service recovery options to diagnose and resolve service-related issues

**Level:** 3  
**Credit value:** 3  
**UAN:** H/501/2712

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Planning and Maintaining a Windows Server 2003 Network Infrastructure exam. In order to do this the learner will learn to plan and implement different server roles and security options. The learner will also learn to plan, implement and maintain a network infrastructure. They will learn to implement routing and plan for, and implement, remote access to their server environment. Finally the learner will learn to plan and implement a security infrastructure.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Be able to planning and implementing server roles and server security
2. Be able to planning, implementing, and maintaining a network infrastructure
3. Be able to planning, implementing, and maintaining routing and remote access
4. Be able to planning, implementing, and maintaining server availability
5. Be able to planning and maintaining network security
6. Be able to planning, implementing, and maintaining security infrastructure

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **28** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by using the relevant Microsoft test.

# **Unit 4520-342      Planning and maintaining a Microsoft Windows Server 2003 network infrastructure**

## Assessment Criteria

### **Outcome 1      Be able to planning and implementing server roles and server security**

The learner can:

1. Configure security for servers that are assigned specific roles
2. Plan a secure baseline installation
  - Plan a strategy to enforce system default security settings on new systems
  - Identify client operating system default security settings
  - Identify all server operating system default security settings
3. Plan security for servers that are assigned specific roles. Roles might include domain controllers, Web servers, database servers, and mail servers
  - Deploy the security configuration for servers that are assigned specific roles
  - Create custom security templates based on server roles
4. Evaluate and select the operating system to install on computers in an enterprise
  - Identify the minimum configuration to satisfy security requirements

### **Outcome 2      Be able to planning, implementing, and maintaining a network infrastructure**

The learner can:

1. Plan a TCP/IP network infrastructure strategy
  - Analyze IP addressing requirements
  - Plan an IP routing solution
  - Create an IP subnet scheme
2. Plan and modify a network topology
  - Plan the physical placement of network resources
  - Identify network protocols to be used
3. Plan an Internet connectivity strategy
4. Plan network traffic monitoring. Tools might include Network Monitor and System Monitor
5. Troubleshoot connectivity to the Internet
  - Diagnose and resolve issues related to Network Address Translation (NAT)
  - Diagnose and resolve issues related to name resolution cache information
  - Diagnose and resolve issues related to client configuration
6. Troubleshoot TCP/IP addressing
  - Diagnose and resolve issues related to client computer configuration
  - Diagnose and resolve issues related to DHCP server address assignment

7. Plan a host name resolution strategy
  - Plan a DNS namespace design
  - Plan zone replication requirements
  - Plan a forwarding configuration
  - Plan for DNS security
  - Examine the interoperability of DNS with third-party DNS solutions
8. Plan a NetBIOS name resolution strategy
  - Plan a WINS replication strategy
  - Plan NetBIOS name resolution by using the Lmhosts file
9. Troubleshoot host name resolution
  - Diagnose and resolve issues related to DNS services
  - Diagnose and resolve issues related to client computer configuration

### **Outcome 3 Be able to planning, implementing, and maintaining routing and remote access**

The learner can:

1. Plan a routing strategy
  - Identify routing protocols to use in a specified environment
  - Plan routing for IP multicast traffics
2. Plan security for remote access users
  - Plan remote access policies
  - Analyze protocol security requirements
  - Plan authentication methods for remote access clients
3. Implement secure access between private networks
  - Create and implement an IPSec policy
4. Troubleshoot TCP/IP routing. Tools might include the route, tracert, ping, pathping, and netsh commands and Network Monitor

### **Outcome 4 Be able to planning, implementing, and maintaining server availability**

The learner can:

1. Plan services for high availability
  - Plan a high availability solution that uses clustering services
  - Plan a high availability solution that uses Network Load Balancing
2. Identify system bottlenecks, including memory, processor, disk, and network related bottlenecks
  - Identify system bottlenecks by using System Monitor
3. Implement a cluster server
  - Recover from cluster node failure
4. Manage Network Load Balancing. Tools might include the Network Load Balancing Monitor Microsoft Management Console (MMC) snap-in and the WLBS cluster control utility
5. Plan a backup and recovery strategy
  - Identify appropriate backup types. Methods include full, incremental, and differential
  - Plan a backup strategy that uses volume shadow copy
  - Plan system recovery that uses Automated System Recovery (ASR)

## **Outcome 5 Be able to planning and maintaining network security**

The learner can:

1. Configure network protocol security
  - Configure protocol security in a heterogeneous client computer environment
  - Configure protocol security by using IPSec policies
2. Configure security for data transmission
  - Configure IPSec policy settings
3. Plan for network protocol security
  - Specify the required ports and protocols for specified services
  - Plan an IPSec policy for secure network communications
4. Plan secure network administration methods
  - Create a plan to offer Remote Assistance to client computers
  - Plan for remote administration by using Terminal Services
5. Plan security for wireless networks
6. Plan security for data transmission
  - Secure data transmission between client computers to meet security requirements
  - Secure data transmission by using IPSec
7. Troubleshoot security for data transmission. Tools might include the IP Security Monitor MMC snap-in and the Resultant Set of Policy (RSOP) MMC snap-in

## **Outcome 6 Be able to planning, implementing, and maintaining security infrastructure**

The learner can:

1. Configure Active Directory directory service for certificate publication
2. Plan a public key infrastructure (PKI) that uses Certificate Services
  - Identify the appropriate type of certificate authority to support certificate issuance requirements
  - Plan the enrollment and distribution of certificates
  - Plan for the use of smart cards for authentication
3. Plan a framework for planning and implementing security
  - Plan for security monitoring
  - Plan a change and configuration management framework for security
4. Plan a security update infrastructure. Tools might include Microsoft Baseline Security Analyzer and Microsoft Software Update Services

**Level:** 3  
**Credit value:** 7  
**UAN:** R/501/2866

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Implementing and Administering Security in a Microsoft Windows Server 2003 Network exam. In order to do this the learner will learn to implement, manage and troubleshoot security policies using the built in features of the server environment. The learner will learn to implement and troubleshoot patch management infrastructure within their server and they will learn to plan, configure and troubleshoot authentication, authorisation and PKI.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to implement, manage, and troubleshoot security policies
2. Be able to implement, manage, and troubleshoot patch management infrastructure
3. Be able to implement, manage, and troubleshoot security for network communications
4. Be able to plan, configure, and troubleshoot authentication, authorization, and PKI

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **65** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by using the relevant Microsoft test.

# Unit 4520-343      **Implementing and Administering Security in a Microsoft Windows Server 2003 Network**

## Assessment Criteria

### **Outcome 1      Be able to implement, manage, and troubleshoot security policies**

The learner can:

1. Plan security templates based on computer role. Computer roles include SQL Server computer, Microsoft Exchange Server computer, domain controller, Internet Authentication Service (IAS) server, and Internet Information Services (IIS) server
2. Configure security templates
  - Configure registry and file system permissions
  - Configure account policies
  - Configure .pol files
  - Configure audit policies
  - Configure user rights assignment
  - Configure security options
  - Configure system services
  - Configure restricted groups
  - Configure event logs
3. Deploy security templates
  - Plan the deployment of security templates
  - Deploy security templates by using Active Directory-based Group Policy objects (GPOs)
  - Deploy security templates by using command-line tools and scripting
4. Troubleshoot security template problems
  - Troubleshoot security templates in a mixed operating system environment
  - Troubleshoot security policy inheritance
  - Troubleshoot removal of security template settings
5. Configure additional security based on computer roles. Server computer roles include SQL Server computer, Exchange Server computer, domain controller, Internet Authentication Service (IAS) server, and Internet Information Services (IIS) server. Client computer roles include desktop, portable, and kiosk
  - Plan and configure security settings
  - Plan network zones for computer roles
  - Plan and configure software restriction policies
  - Plan security for infrastructure services. Services include DHCP and DNS
  - Plan and configure auditing and logging for a computer role. Considerations include Windows Events, Internet Information Services (IIS), firewall log files, Netlog, and RAS log files
  - Analyze security configuration. Tools include Microsoft Baseline Security Analyzer (MBSA), the MBSA command-line tool, and Security Configuration and Analysis

## **Outcome 2 Be able to implement, manage, and troubleshoot patch management infrastructure**

The learner can:

1. Plan the deployment of service packs and hotfixes
  - Evaluate the applicability of service packs and hotfixes
  - Test the compatibility of service packs and hotfixes for existing applications.
  - Plan patch deployment environments for both the pilot and production phases
  - Plan the batch deployment of multiple hotfixes
  - Plan rollback strategy
2. Assess the current status of service packs and hotfixes. Tools include MBSA and the MBSA command-line tool
  - Assess current patch levels by using the MBSA GUI tool
  - Assess current patch levels by using the MBSA command-line tool with scripted solutions
3. Deploy service packs and hotfixes
  - Deploy service packs and hotfixes on new servers and client computers. Considerations include slipstreaming, custom scripts, and isolated installation or test networks
  - Deploy service packs and hotfixes on existing servers and client computers

## **Outcome 3 Be able to implement, manage, and troubleshoot security for network communications**

The learner can:

1. Plan IPSec deployment.
  - Decide which IPSec mode to use
  - Plan authentication methods for IPSec
  - Test the functionality of existing applications and services
2. Configure IPSec policies to secure communication between networks and hosts. Hosts include domain controllers, Internet Web servers, databases, email servers, and client computers.
  - Configure IPSec authentication
  - Configure appropriate encryption levels. Considerations include the selection of perfect forward secrecy (PFS) and key lifetimes
  - Configure the appropriate IPSec protocol. Protocols include Authentication Header (AH) and Encapsulating Security Payload (ESP)
  - Configure IPSec inbound and outbound filters and filter actions
3. Deploy and manage IPSec policies
  - Deploy IPSec policies by using Local policy objects or Group Policy objects (GPOs)
  - Deploy IPSec policies by using commands and scripts. Tools include IPSecPol and NetSh
  - Deploy IPSec certificates. Considerations include deployment of certificates and renewing certificates on managed and unmanaged client computers
4. Troubleshoot IPSec
  - Monitor IPSec policies by using IP Security Monitor
  - Configure IPSec logging. Considerations include Oakley logs and IPSec driver logging
  - Troubleshoot IPSec across networks. Considerations include network address translation, port filters, protocol filters, firewalls, and routers
  - Troubleshoot IPSec certificates. Considerations include enterprise trust policies and certificate revocation list (CRL) checking
5. Plan and implement security for wireless networks
  - Plan the authentication methods for a wireless network
  - Plan the encryption methods for a wireless network

- Plan wireless access policies
  - Configure wireless encryption
  - Install and configure wireless support for client computers
6. Deploy, manage, and configure SSL certificates, including uses for HTTPS, LDAPS, and wireless networks. Considerations include renewing certificates and obtaining self-issued certificates instead of publicly issued certificates
    - Obtain self-issued certificates and publicly issued certificates
    - Install certificates for SSL
    - Renew certificates
    - Configure SSL to secure communication channels. Communication channels include client computer to Web server, Web server to SQL Server computer, client computer to Active Directory domain controller, and email server to client computer
  7. Configure security for remote access users
    - Configure authentication for secure remote access. Authentication types include PAP, CHAP, MS-CHAP, MS-CHAP v2, EAP-MD5, EAP-TLS, and multifactor authentication that combines smart cards and EAP
    - Configure and troubleshoot virtual private network (VPN) protocols. Considerations include Internet service provider (ISP), client operating system, network address translation devices, Routing and Remote Access servers, and firewall servers
    - Manage client configuration for remote access security. Tools include remote access policy and the Connection Manager Administration Kit

## **Outcome 4 Be able to plan, configure, and troubleshoot authentication, authorization, and PKI**

The learner can:

1. Plan and configure authentication
  - Plan, configure, and troubleshoot trust relationships
  - Plan and configure authentication protocols
  - Plan and configure multifactor authentication
  - Plan and configure authentication for Web users
  - Plan and configure delegated authentication
2. Plan group structure
  - Decide which types of groups to use
  - Plan security group scope
  - Plan nested group structure
3. Plan and configure authorization
  - Configure access control lists (ACLs)
  - Plan and troubleshoot the assignment of user rights
  - Plan requirements for digital signatures
4. Install, manage, and configure Certificate Services
  - Install and configure root, intermediate, and issuing certification authorities (CAs). Considerations include renewals and hierarchy
  - Configure certificate templates
  - Configure, manage, and troubleshoot the publication of certificate revocation lists (CRLs)
  - Configure archival and recovery of keys
  - Deploy and revoke certificates to users, computers, and CAs
  - Backup and restore the CA

**Level:** 3  
**Credit value:** 8  
**UAN:** H/601/6799

**Unit aim**

The aim of this unit is to teach the learner how to install and configure a Windows 7 enterprise desktop. In order to do this the learner will learn how to manage the installation of Windows 7 whilst learning to manage the activation and licensing of the operating system. The learner will also learn how to create a standard image and client configuration for future deployment and learn to design application packages for deployment.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to plan and manage a client life cycle strategy
2. Be able to design a standard image
3. Be able to design client configurations
4. Be able to design a Windows 7 client deployment
5. Be able to design application packages for deployment

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **70** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-344      Windows 7, Enterprise Desktop Administrator**

## Assessment Criteria

### **Outcome 1    Be able to plan and manage a client life cycle strategy**

The learner can:

1. Plan and manage client licensing and activation
2. Plan and manage software updates
3. Plan and manage a physical hardware and virtualization strategy.

### **Outcome 2    Be able to design a standard image**

The learner can:

1. Design an image creation strategy
2. Design a custom image
3. Define an image update strategy

### **Outcome 3    Be able to design client configurations**

The learner can:

1. Design standard system settings
2. Define client security standards
3. Define Windows Internet Explorer settings

### **Outcome 4    Be able to design a Windows 7 client deployment**

The learner can:

1. Analyze the environment and choose appropriate deployment methods
2. Design a lite-touch deployment strategy
3. Design a zero-touch deployment strategy
4. Design a user state migration strategy

### **Outcome 5    Be able to design application packages for deployment**

The learner can:

1. Design a delivery or deployment strategy
2. Manage application compatibility

**Level:** 3  
**Credit value:** 13  
**UAN:** H/502/3581

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Microsoft SQL Server 2005 – Implementation and Maintenance exam. In order to this the learner will learn to install and configure SQL server 2005. They will learn to implement high availability and disaster recovery within the server and how to maintain installed databases. Lastly, the learner will learn to monitor and troubleshoot SQL server performance.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Be able to install and configure SQL Server 2005
2. Be able to implement high availability and disaster recovery
3. Be able to support data consumers
4. Be able to maintain databases
5. Be able to monitor and troubleshoot SQL Server performance
6. Be able to creating and implementing database objects

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by using the relevant Microsoft test.

# **Unit 4520-345      Microsoft SQL Server 2005 - implementation and maintenance**

## Assessment Criteria

### **Outcome 1    Be able to install and configure SQL Server 2005**

The learner can:

1. Install SQL Server 2005
2. Configure SQL Server 2005 instances and databases
3. Configure SQL Server security
4. Configure linked servers by using SQL Server Management Studio (SSMS)

### **Outcome 2    Be able to implement high availability and disaster recovery**

The learner can:

1. Implement database mirroring
2. Implement log shipping
3. Manage database snapshots

### **Outcome 3    Be able to support data consumers**

The learner can:

1. Retrieve data to support ad hoc and recurring queries
2. Manipulate relational data
3. Manage XML data
4. Implement an HTTP endpoint
5. Implement Service Broker components
6. Import and export data from a file
7. Manage replication

### **Outcome 4    Be able to maintain databases**

The learner can:

1. Implement and maintain SQL Server Agent jobs
2. Manage databases by using Transact-SQL
3. Back up a database
4. Restore a database
5. Move a database between servers

### **Outcome 5    Be able to monitor and troubleshoot SQL Server performance**

The learner can:

1. Gather performance and optimization data by using the SQL Server Profiler
2. Gather performance and optimization data by using the Database Engine Tuning Advisor
3. Monitor and resolve blocks and deadlocks
4. Diagnose and resolve database server errors
5. Monitor SQL Server Agent job history
6. Gather performance and optimization data by using DMVs

## **Outcome 6 Be able to creating and implementing database objects**

The learner can:

1. Implement a table
2. Implement a view
3. Implement triggers
4. Implement functions
5. Implement stored procedures
6. Implement constraints
7. Implement indexes
8. Create user-defined types
9. Implement a full-text search

**Level:** 3  
**Credit value:** 13  
**UAN:** M/502/3650

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Microsoft Configuring Windows Server 2008 Active Directory exam. The aim of this unit is to teach the learner how to configure domain name services. The learner will also configure the active directory structure as well as configuring additional roles. They will also learn to create and manage active directory objects and configure certificate services.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Be able to configure Domain Name System (DNS) for active directory
2. Be able to configure the active directory infrastructure
3. Be able to configure additional active directory server roles
4. Be able to create and maintain active directory objects
5. Be able to maintain the active directory environment
6. Be able to configure active directory certificate services

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-346      Configuring Windows Server 2008 Active Directory**

## Assessment Criteria

### **Outcome 1    Be able to configure Domain Name System (DNS) for active directory**

The learner can:

1. Configure zones
2. Configure DNS server settings
3. Configure zone transfers and replication

### **Outcome 2    Be able to configure the active directory infrastructure**

The learner can:

1. Configure a forest or a domain
2. Configure trusts
3. Configure Active Directory replication
4. Configure sites
5. Configure the global catalog
6. Configure operations masters

### **Outcome 3    Be able to configure additional active directory server roles**

The learner can:

1. Configure Active Directory Lightweight Directory Service (AD LDS)
2. Configure Active Directory Rights Management Service (AD RMS)
3. Configure the read-only domain controller (RODC)
4. Configure Active Directory Federation Services (AD FS)

### **Outcome 4    Be able to create and maintain active directory objects**

The learner can:

1. Automate creation of Active Directory accounts
2. Maintain Active Directory accounts
3. Create and apply Group Policy objects (GPOs)
4. Configure GPO templates
5. Configure software deployment GPOs
6. Configure audit policy by using GPOs
7. Configure account policies

### **Outcome 5    Be able to maintain the active directory environment**

The learner can:

1. Configure backup and recovery
2. Perform offline maintenance
3. Monitor Active Directory

## **Outcome 6 Be able to configure active directory certificate services**

The learner can:

1. Install Active Directory Certificate Services
2. Configure CA server settings
3. Manage certificate templates
4. Manage enrolments
5. Manage certificate revocations

**Level:** 3  
**Credit value:** 11  
**UAN:** J/502/3640

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Microsoft Configuring Windows Server 2008 Network Infrastructure exam. In order to do this the learner will learn to configure IP addressing and other services built into the server. They will also learn to configure name resolution and network access and will learn to monitor and manage network infrastructure.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to configure IP addressing and services
2. Be able to configure name resolution
3. Be able to configure network access
4. Be able to configuring file and print services
5. Be able to monitor and manage a network infrastructure

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-347      Configuring Windows Server 2008 Network Infrastructure**

## Assessment Criteria

### **Outcome 1    Be able to configure IP addressing and services**

The learner can:

1. Configure IPv4 and IPv6 addressing
2. Configure Dynamic Host Configuration Protocol (DHCP)
3. Configure routing
4. Configure IPsec

### **Outcome 2    Be able to configure name resolution**

The learner can:

1. Configure a Domain Name System (DNS) server
2. Configure DNS zones
3. Configure DNS records
4. Configure DNS replication
5. Configure name resolution for client computers

### **Outcome 3    Be able to configure network access**

The learner can:

1. Configure remote access)
2. Configure Network Access Protection (NAP)
3. Configure network authentication
4. Configure wireless access
5. Configure firewall settings

### **Outcome 4    Be able to configuring file and print services**

The learner can:

1. Configure a file server
2. Configure Distributed File System (DFS)
3. Configure shadow copy services
4. Configure backup and restore
5. Manage disk quotas
6. Configure and monitor print services

### **Outcome 5    Be able to monitor and manage a network infrastructure**

The learner can:

1. Configure Windows Server Update Services (WSUS) server settings
2. Capture performance data
3. Monitor event logs
4. Gather network data

**Level:** 3  
**Credit value:** 13  
**UAN:** L/502/3638

**Unit aim**

The aim of this unit is to teach the learner how to configure a Microsoft Windows Server 2008 Applications Infrastructure. In order to do this the learner will learn to deploy servers and configure terminal services. They will also learn to configure a web services infrastructure and network application services.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to deploy servers
2. Be able to configure terminal services
3. Be able to configure a web services infrastructure
4. Be able to configure network application services

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-348      Configuring Windows Server 2008 Applications Infrastructure**

## Assessment Criteria

### **Outcome 1    Be able to deploy servers**

The learner can:

1. Deploy images by using Windows Deployment Services
2. Configure Microsoft Windows activation
3. Configure Windows Server Hyper-V and virtual machines
4. Configure high availability
5. Configure storage

### **Outcome 2    Be able to configure terminal services**

The learner can:

1. Configure Windows Server 2008 Terminal Services RemoteApp (TS RemoteApp)
2. Configure Terminal Services Gateway
3. Configure Terminal Services load balancing
4. Configure and monitor Terminal Services resources
5. Configure Terminal Services licensing
6. Configure Terminal Services client connections
7. Configure Terminal Services server options

### **Outcome 3    Be able to configure a web services infrastructure**

The learner can:

1. Configure Web applications
2. Manage Web sites
3. Configure a File Transfer Protocol (FTP) server
4. Configure Simple Mail Transfer Protocol (SMTP)
5. Manage Internet Information Services (IIS)
6. Configure SSL security
7. Configure Web site authentication and permissions

### **Outcome 4    Be able to configure network application services**

The learner can:

1. Configure Windows Media server
2. Configure Digital Rights Management (DRM)
3. Configure Microsoft Windows SharePoint Services server options
4. Configure Windows SharePoint Services email integration

**Level:** 3  
**Credit value:** 11  
**UAN:** J/502/3637

**Unit aim**

The aim of this unit is to teach the learner how to administer a Microsoft Windows 2008 Server. In order to do this the learner will learn how to plan for the deployment of a server environment, they will also learn how to plan for server management and how to monitor and maintain servers. The learner will also learn to plan for business continuity and high availability.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to plan for server deployment
2. Be able to plan for server management
3. Be able to monitor and maintain servers
4. Be able to plan application and data provisioning
5. Be able to plan for business continuity and high availability

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-349      Windows Server 2008, Server Administrator**

## Assessment Criteria

### **Outcome 1    Be able to plan for server deployment**

The learner can:

1. Plan server installations and upgrades
2. Plan for automated server deployment
3. Plan infrastructure services server roles
4. Plan application servers and services
5. Plan file and print server roles

### **Outcome 2    Be able to plan for server management**

The learner can:

1. Plan server management strategies
2. Plan for delegated administration
3. Plan and implement group policy strategy

### **Outcome 3    Be able to monitor and maintain servers**

The learner can:

1. Implement patch management strategy
2. Monitor servers for performance evaluation and optimization
3. Monitor and maintain security and policies

### **Outcome 4    Be able to plan application and data provisioning**

The learner can:

1. Provision applications
2. Provision data

### **Outcome 5    Be able to plan for business continuity and high availability**

The learner can:

1. Plan storage
2. Plan high availability
3. Plan for backup and recovery

**Level:** 3  
**Credit value:** 14  
**UAN:** T/502/3634

**Unit aim**

The aim of this unit is to teach the learner how to administer a Microsoft Windows server 2008 enterprise edition. In order to do this the learner will learn how to plan network and application services, design core identity and access management components. The learner will learn to design support identity and access management components. Lastly the learner will design for with business and continuity in mind.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to plan network and application services
2. Be able to design core identity and access management components
3. Be able to design support identity and access management components
4. Be able to design for business continuity and data availability

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-350      Windows Server 2008, Enterprise Administrator**

## Assessment Criteria

### **Outcome 1    Be able to plan network and application services**

The learner can:

1. Plan for name resolution and IP addressing
2. Design for network access
3. Plan for application delivery
4. Plan for Terminal Services

### **Outcome 2    Be able to design core identity and access management components**

The learner can:

1. Design Active Directory forests and domains
2. Design the Active Directory physical topology
3. Design the Active Directory administrative model
4. Design the enterprise-level group policy strategy

### **Outcome 3    Be able to design support identity and access management components**

The learner can:

1. Plan for domain or forest migration, upgrade, and restructuring
2. Design the branch office deployment
3. Design and implement public key infrastructure
4. Plan for interoperability

### **Outcome 4    Be able to design for business continuity and data availability**

The learner can:

1. Plan for business continuity
2. Design for software updates and compliance management
3. Design the operating system virtualization strategy
4. Design for data management and data access

**Level:** 3  
**Credit value:** 10  
**UAN:** J/600/4287

**Unit aim**

The aim of this unit is to provide the underpinning knowledge required for a learner to sit the Implementing and Maintaining Microsoft SQL Server 2008 exam. In order to this the learner will learn to install and configure SQL server 2008. They will learn to implement high availability and disaster recovery within the server as well as learning to implement server security. The learner will also learn to maintain installed databases and how to monitor and troubleshoot SQL server performance.

**Learning outcomes**

There are **eight** learning outcomes to this unit. The learner will:

1. Be able to install and configure SQL Server 2008
2. Be able to maintain SQL Server instances
3. Be able to manage SQL Server security
4. Be able to maintain a SQL Server database
5. Be able to perform data management tasks
6. Be able to monitor and troubleshoot SQL Server
7. Be able to optimize SQL Server performance
8. Be able to implement high availability

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **54** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by using the relevant Microsoft test.

# **Unit 4520-351      Implementing and Maintaining Microsoft SQL Server 2008**

## Assessment Criteria

### **Outcome 1    Be able to install and configure SQL Server 2008**

The learner can:

1. Install SQL Server 2008 and related services
2. Configure SQL Server instances
3. Configure SQL Server services
4. Configure additional SQL Server components
5. Implement database mail, configure full-text indexing

### **Outcome 2    Be able to maintain SQL Server instances**

The learner can:

1. Manage SQL Server Agent jobs
2. Manage SQL Server Agent alerts
3. Manage SQL Server Agent operators
4. Implement the declarative management framework (DMF)
5. Back up a SQL Server environment

### **Outcome 3    Be able to manage SQL Server security**

The learner can:

1. Manage logins and server roles
2. Manage users and database roles
3. Manage SQL Server instance permissions
4. Manage database permissions
5. Manage schema permissions and object permissions
6. Audit SQL Server instances
7. Manage transparent data encryption
8. Configure surface area

### **Outcome 4    Be able to maintain a SQL Server database**

The learner can:

1. Back up databases
2. Restore databases
3. Manage and configure databases
4. Manage database snapshots
5. Maintain database integrity
6. Maintain a database by using maintenance plans

### **Outcome 5    Be able to perform data management tasks**

The learner can:

1. Import and export data
2. Manage data partitions
3. Implement data compression
4. Maintain indexes
5. Manage collations

## **Outcome 6 Be able to monitor and troubleshoot SQL Server**

The learner can:

1. Identify SQL Server service problems
2. Identify concurrency problems
3. Identify SQL Agent job execution problems
4. Locate error information

## **Outcome 7 Be able to optimize SQL Server performance**

The learner can:

1. Implement Resource Governor
2. Use the Database Engine Tuning Advisor
3. Collect trace data by using SQL Server Profiler
4. Collect performance data by using Dynamic Management Views (DMVs)
5. Collect performance data by using System Monitor
6. Use Performance Studio

## **Outcome 8 Be able to implement high availability**

The learner can:

1. Implement database mirroring
2. Implement a SQL Server clustered instance
3. Implement log shipping
4. Implement replication

**Level:** 3  
**Credit value:** 19  
**UAN:** K/501/3912

**Learning outcomes**

There are **twelve** learning outcomes to this unit. The learner will:

1. Be able to command a radio detachment
2. Operate the Local Area Sub-system (LAS)
3. Be able to manage unit/sub-unit signals training
4. Attend briefings on BOWMAN Digitization functionality
5. Manage BOWMAN and non BOWMAN equipment
6. Be able to supervise battery charging
7. Construct an antenna for advanced communications
8. Advise on communication security and electronic warfare matters
9. Establish communication using re-broadcast facilities
10. Operate the Communication Information Handler (CIH) application
11. Operate the Key Encryption Key (KEK) fill Device
12. Operation Common Battlefield Application Toolset (ComBAT)

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **150** hours should be allocated for this unit.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-360      Using and Managing BOWMAN systems for Advanced Signallers**

## Assessment Criteria

### **Outcome 1    Be able to command a radio detachment**

The learner can:

1. Extract information from a briefing/orders group
2. Explain how to brief a signals detachment
3. Conduct a line reconnaissance
4. Explain how to brief a line party
5. Control the laying, testing and recovery of line
6. Explain how to brief a detachment on Health and Safety risks
7. Control the initialisation of communication equipment
8. Extract and interpret signals information from policies and procedures
9. Demonstrate how to control the handover or takeover of a communications detachment
10. Describe how to control cryptographic equipment and material
11. Identify health and safety risks

### **Outcome 2    Operate the Local Area Sub-system (LAS)**

The learner can:

1. Demonstrate how to prepare the simple harness
2. Demonstrate how to prepare the basic functional LAS and remote connections
3. Demonstrate how to prepare the full functional LAS and remote connection

### **Outcome 3    Be able to manage unit/sub-unit signals training**

The learner can:

1. Identify and plan unit or sub-unit signal training needs
2. Select appropriate methods of instruction
3. Carry out a minimum of 3 teaching practices in accordance with Defence Instruction and Techniques process
4. Pass the Defence Instruction and Technique course

### **Outcome 4    Attend briefings on BOWMAN Digitization functionality**

The learner can:

1. Identify how voice and data technologies are utilised within the BOWMAN architecture
2. Identify the components and function of the BOWMAN Communication Management Systems (BCMS) applications
3. Identify the characteristics and capabilities of the GPS systems and components of Navigation warfare (NAVWAR)
4. Identify the components of the Apache BOWMAN Connectivity (ABC)

### **Outcome 5    Manage BOWMAN and non BOWMAN equipment**

The learner can:

1. Demonstrate how to maintain a sub-unit account of radios and associated equipment
2. Carry out functional tests on radio equipment
3. Demonstrate how to perform basic maintenance of communications equipment
4. Demonstrate how to perform tests and verification on suspect equipment
5. Locate faults to LRU level

## **Outcome 6 Be able to supervise battery charging**

The learner can:

1. Establish DC (Direct Current) battery charging areas
2. Demonstrate how to maintain battery charging equipment

## **Outcome 7 Construct an antenna for advanced communications**

The learner can:

1. State the principles applicable to electromagnetic theory and propagation of radio waves
2. Calculate, select and assemble a suitable antenna for high frequency (HF) communications

## **Outcome 8 Advise on communication security and electronic warfare matters**

The learner can:

1. Demonstrate how to monitor insecure systems
2. Demonstrate how to debrief a detachment on security breaches
3. Advise commanders on communication security matters within the unit
4. Advise on electronic warfare
5. Describe ElectronicPM, Tactical and Technical
6. State electronic warfare procedures

## **Outcome 9 Establish communication using re-broadcast facilities**

The learner can:

1. Operate communication systems to a number of outstations
2. Operate as a local re-broadcast using any two communication systems to a number of outstations

## **Outcome 10 10. Operate the Communication Information Handler (CIH) application**

The learner can:

1. Prepare the CIH application for operation
2. Operate CIH application
3. Perform user maintenance on the CIH

## **Outcome 11 Operate the Key Encryption Key (KEK) fill Device**

The learner can:

1. Prepare the Key Encryption Key (KEK) fill Device for operation
2. Operate the Key Encryption Key (KEK) fill Device
3. Perform user maintenance on KFD

## **Outcome 12 Operation Common Battlefield Application Toolset (ComBAT)**

The learner can:

1. Explain how to create symbols
2. Explain how to create overlays
3. Describe how to view and/or amend location status board
4. Describe how to view track history playback
5. Configure CPR
6. Produce plans and orders using ComBAT
7. Demonstrate how to manage messages and data
8. Demonstrate how to Load ComBAT mapping

**Level:** 3  
**Credit value:** 5  
**UAN:** R/502/4614

**Unit aim**

The aim of this unit is to teach the learner how to use imaging software correctly. In order to do this the learner will describe what images are needed, describe any copyright and other constraints that affect those images that are going to be used, describe the context with which those images will be used and learn how to store them correctly. The learner will also learn to use imaging software and tools responding to problems with accuracy and to a high standard.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to obtain, insert and combine information for images
2. Be able to use imaging software tools to create, manipulate and edit images

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **40** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-371      Imaging Software

## Assessment Criteria

### **Outcome 1      Be able to obtain, insert and combine information for images**

The learner can:

1. Explain what images are needed
2. Explain how the context affects the way images should be prepared
3. Provide guidance on what and how any copyright or other constraints may apply to the use of own and others' images
4. Obtain, insert and prepare images
5. Explain how file format affects image quality, format and size and how to choose appropriate formats for savings images
6. Use appropriate techniques to organise and combine information of different types or from different sources
7. Store and retrieve files effectively, in line with guidelines and conventions where available

### **Outcome 2      Be able to use imaging software tools to create, manipulate and edit images**

The learner can:

1. Explain what technical factors affecting images need to be taken into account and how to do so
2. Select and use suitable tools and techniques efficiently to create images
3. Use guide lines and dimensioning tools appropriately to enhance precision
4. Select and use appropriate tools and techniques to manipulate and edit images
5. Check images meet needs, using IT tools and making corrections as necessary
6. Identify and respond appropriately to quality problems to ensure that images are fit for purpose and meet needs

**Level:** 3  
**Credit value:** 6  
**UAN:** T/502/4556

**Unit aim**

The aim of this unit is to teach the learner how to use database software effectively. In order to do this the learner will learn to create and modify relational database tables, enter, edit and organise structured information checking that data has been entered correctly. The learner will also produce queries and reports that manipulate the data within the database and will check that outputs meet any customer requirements.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to plan, create and modify relational database tables to meet requirements
2. Be able to enter, edit and organise structured information in a databases
3. Be able to use database software tools to create, edit and run data queries and produce reports

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

## **Unit 4520-372 Database software**

### Assessment Criteria

#### **Outcome 1 Be able to plan, create and modify relational database tables to meet requirements**

The learner can:

1. Explain how a relational database design enables data to be organised and queried
2. Plan and create multiple tables for data entry with appropriate fields and properties
3. Set up and modify relationships between database tables
4. Explain why and how to maintain data integrity
5. Respond appropriately to problems with database tables
6. Use database tools and techniques to ensure data integrity is maintained

#### **Outcome 2 Be able to enter, edit and organise structured information in a databases**

The learner can:

1. Design and create forms to access, enter, edit and organise data in a database
2. Select and use appropriate tools and techniques to format data entry forms
3. Check data entry meets needs, using IT tools and making corrections as necessary
4. Respond appropriately to data entry errors

#### **Outcome 3 Be able to use database software tools to create, edit and run data queries and produce reports**

The learner can:

1. Explain how to select, generate and output information from queries according to requirements
2. Create and run database queries to display, amend or calculate selected data
3. Plan and produce database reports from a multiple-table relational database
4. Select and use appropriate tools and techniques to format database reports
5. Check reports meet needs, using IT tools and making corrections as necessary

**Level:** 3  
**Credit value:** 3  
**UAN:** T/502/4301

**Unit aim**

The aim of this unit is to teach the learner how to use email software effectively and correctly. In order to do this the learner will learn how to use the tools in an email client to compose and send emails. They will also explore methods to improve message transmission and learn how to use techniques to automate responses. The learner will be taught how to handle and manage incoming emails, for example how to archive emails, and they will learn how to respond to any email problems that may arise.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to use email software tools and techniques to compose and send messages
2. Be able to manage use of email software effectively

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-373 Using email

## Assessment Criteria

### **Outcome 1 Be able to use email software tools and techniques to compose and send messages**

The learner can:

1. Select and use software tools to compose and format email messages, including attachments
2. Explain methods to improve message transmission
3. Send email messages to individuals and groups
4. Explain why and how to stay safe and respect others when using email
5. Use an address book to manage contact information

### **Outcome 2 Be able to manage use of email software effectively**

The learner can:

1. Develop and communicate guidelines and procedures for using email effectively
2. Read and respond appropriately to email messages and attachments
3. Use email software tools and techniques to automate responses
4. Explain why, how and when to archive messages
5. Organise, store and archive email messages effectively
6. Customise email software to make it easier to use
7. Explain how to minimise email problems
8. Respond appropriately to email problems

# Unit 4520-374      Using the Internet

**Level:**                3  
**Credit value:**      5  
**UAN:**                F/502/4298

## Unit aim

The aim of this unit is to teach the learner how to use the Internet correctly and safely. In order to do this the learner will learn how to connect to the Internet , how to use a web browser effectively and how to improve the performance of a web browser. The learner will also learn how to search for information on the Internet, how use a web browser to communicate information and how to protect themselves from online threats, whilst understanding any laws governing the use of the Internet and promote these to others.

## Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Be able to select and set up an appropriate connection to access the Internet
2. Be able to set up and use browser software to navigate webpages
3. Be able to use browser tools to search effectively and efficiently for information from the Internet
4. Be able to use browser software to communicate information online
5. Be able to develop and apply appropriate safety and security practices and procedures when working online

## Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **40** hours should be allocated for this unit.

## Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

## How is this unit assessed?

Assessment is by a learner portfolio.

# Unit 4520-374 Using the Internet

## Assessment Criteria

### **Outcome 1 Be able to select and set up an appropriate connection to access the Internet**

The learner can:

1. Identify different types of connection methods that can be used to access the Internet
2. Explain the benefits and drawbacks of different connection methods
3. Analyse the issues affecting different groups of users
4. Select and set up an Internet connection using an appropriate combination of hardware and software
5. Recommend a connection method for Internet access to meet identified needs
6. Diagnose and solve Internet connection problems

### **Outcome 2 Be able to set up and use browser software to navigate webpages**

The learner can:

1. Select and use browser tools to navigate webpages effectively
2. Explain when to change browser settings to aid navigation
3. Adjust and monitor browser settings to maintain and improve performance
4. Explain when and how to improve browser performance
5. Customise browser software to make it easier to use

### **Outcome 3 Be able to use browser tools to search effectively and efficiently for information from the Internet**

The learner can:

1. Select and use appropriate search techniques to locate information efficiently
2. Evaluate how well information meets requirements
3. Manage and use references to make it easier to find information another time
4. Download, organise and store different types of information from the Internet

### **Outcome 4 Be able to use browser software to communicate information online**

The learner can:

1. Identify and analyse opportunities to create, post or publish material to websites
2. Select and use appropriate tools and techniques to communicate information online
3. Share and submit information online using appropriate language and moderate content from others

## **Outcome 5 Be able to develop and apply appropriate safety and security practices and procedures when working online**

The learner can:

1. Explain the threats to system performance when working online
2. Work responsibly and take appropriate safety and security precautions when working online
3. Explain the threats to information security and integrity when working online
4. Keep information secure and manage user access to online sources securely
5. Explain the threats to user safety when working online
6. Explain how to minimise internet security risks
7. Develop and promote laws, guidelines and procedures for safe and secure use of the Internet

**Level:** 3  
**Credit value:** 6  
**UAN:** T/502/4623

**Unit aim**

The aim of this unit is to teach the learner how to produce presentations properly using presentation software. In order to do this the learner will learn how to combine text and other information within presentation slide, they will learn how to enhance their presentations, how to use some of tools in presentation that aid the structure and edit slide sequences. Lastly the learner will use all that they have learnt to prepare an interactive slideshow for presentation.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to input and combine text and other information within presentation slides
2. Be able to use presentation software tools to structure, edit and format presentations
3. Be able to prepare interactive slideshow for presentation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-375      Presentation software

## Assessment Criteria

### **Outcome 1      Be able to input and combine text and other information within presentation slides**

The learner can:

1. Explain what types of information are required for the presentation
2. Enter text and other information using layouts appropriate to type of information
3. Insert charts and tables and link to source data
4. Insert images, video or sound to enhance the presentation
5. Identify any constraints which may affect the presentation
6. Organise and combine information for presentations in line with any constraints
7. Store and retrieve presentation files effectively, in line with local guidelines and conventions where available

### **Outcome 2      Be able to use presentation software tools to structure, edit and format presentations**

The learner can:

1. Explain when and how to use and change slide structure and themes to enhance presentations
2. Create, amend and use appropriate templates and themes for slides
3. Explain how interactive and presentation effects can be used to aid meaning or impact
4. Select and use appropriate techniques to edit and format presentations to meet needs
5. Create and use interactive elements to enhance presentations
6. Select and use animation and transition techniques appropriately to enhance presentations

### **Outcome 3      Be able to prepare interactive slideshow for presentation**

The learner can:

1. Explain how to present slides to communicate effectively for different contexts
2. Prepare interactive slideshow and associated products for presentation
3. Check presentation meets needs, using IT tools and making corrections as necessary
4. Evaluate presentations, identify any quality problems and discuss how to respond to them
5. Respond appropriately to quality problems to ensure that presentations meet needs and are fit for purpose

**Level:** 3  
**Credit value:** 6  
**UAN:** J/502/4626

**Unit aim**

The aim of this unit is to teach the learner how to use spreadsheet software effectively. In order to do this the learner will learn how to identify which numerical information is needed and how it should be structured. They will also learn how to enter data correctly, how to save the data correctly, how to use the correct formula and analysis tools to meet the given requirements. Lastly the learner will learn how to explain and present their findings to meet the audience's requirements.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to use a spreadsheet to enter, edit and organise numerical and other data
2. Be able to select and use appropriate formulas and data analysis tools and techniques to meet requirements
3. Be able to use tools and techniques to present, and format and publish spreadsheet information

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-376 Spreadsheet software

## Assessment Criteria

### **Outcome 1 Be able to use a spreadsheet to enter, edit and organise numerical and other data**

The learner can:

1. Identify what numerical and other information is needed in the spreadsheet and how it should be structured
2. Enter and edit numerical and other data accurately
3. Combine and link data from different sources
4. Store and retrieve spreadsheet files effectively, in line with local guidelines and conventions where available

### **Outcome 2 Be able to select and use appropriate formulas and data analysis tools and techniques to meet requirements**

The learner can:

1. Explain what methods can be used to summarise, analyse and interpret spreadsheet data and when to use them
2. Select and use a wide range of appropriate functions and formulas to meet calculation requirements
3. Select and use a range of tools and techniques to analyse and interpret data to meet requirements
4. Select and use forecasting tools and techniques

### **Outcome 3 Be able to use tools and techniques to present, and format and publish spreadsheet information**

The learner can:

1. Explain how to present and format spreadsheet information effectively to meet needs
2. Select and use appropriate tools and techniques to format spreadsheet cells, rows, columns and worksheets effectively
3. Select and use appropriate tools and techniques to generate, develop and format charts and graphs
4. Select and use appropriate page layout to present, print and publish spreadsheet information
5. Explain how to find and sort out any errors in formulas
6. Check spreadsheet information meets needs, using IT tools and making corrections as necessary
7. Use auditing tools to identify and respond appropriately to any problems with spreadsheets

**Level:** 3  
**Credit value:** 5  
**UAN:** Y/502/4632

**Unit aim**

The aim of this unit is to teach the learner how to produce effective websites using website software. In order to do this the learner will describe the content and layout of the website that will be produced, they will be able to describe any copyright issues related to the content of the website and provide guidance on this. The learner will learn to use software to create their designs by using the website software features correctly. Finally, the learner will learn how to correctly publish their websites complete with multimedia and interactive features.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to create structures and styles and use them to produce websites
2. Be able to select and use website software tools and features to develop multiple page websites with multimedia and interactive features
3. Be able to publish and test multiple page websites with multimedia and interactive features

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **40** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-377 Website software

## Assessment Criteria

### **Outcome 1 Create structures and styles and use them to produce websites**

The learner can:

1. Determine what website content and layout will be needed for each page and for the site
2. Plan and create web page templates to layout content
3. Select and use website features and structures to enhance website navigation and functionality
4. Create, select and use styles to enhance website consistency and readability
5. Provide guidance on laws, guidelines and constraints that affect the content and use of websites
6. Explain what access issues may need to be taken into account
7. Explain when and why to use different file types for saving content
8. Store and retrieve files effectively, in line with local guidelines and conventions where available

### **Outcome 2 Be able to select and use website software tools and features to develop multiple page websites with multimedia and interactive features**

The learner can:

1. Prepare content for web pages so that it is ready for editing and formatting
2. Organise and combine information needed for web pages in line with any copyright constraints, including across different software
3. Select and use appropriate editing and formatting techniques to aid meaning
4. Select and use appropriate programming and development techniques to add features and enhance websites
5. Select and use file formats that make information easier to download
6. Check web pages meet needs, using IT tools and making corrections as necessary

### **Outcome 3 Be able to publish and test multiple page websites with multimedia and interactive features**

The learner can:

1. Select and use appropriate testing methods to check that all elements and features of complex websites are working as planned
2. Identify any quality problems with websites and explain how to respond to them
3. Select and use an appropriate programme to upload and publish the website and make sure that it will download efficiently
4. Respond appropriately to quality problems with websites to ensure outcomes are fit for purpose

**Level:** 3  
**Credit value:** 6  
**UAN:** Y/502/4629

**Unit aim**

The aim of this unit is to teach the learner how to use word processing software correctly and effectively. In order to do this the learner will learn how to enter, combine and merge text and information accurately within word processing documents. They will learn to use a range a range tools and features within the application. The learner will also learn how create and modify the structure of a document using different styles. Lastly the learner will learn to produce documents that meet the requirements of the intended audiences and ensure that they are fit for purpose.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to enter and combine text and other information accurately within word processing documents
2. Be able to create and modify appropriate layouts, structures and styles for word processing documents
3. Be able to use word processing software tools and techniques to format and present documents effectively to meet requirements

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **45** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-378 Word processing software

## Assessment Criteria

### **Outcome 1 Be able to enter and combine text and other information accurately within word processing documents**

The learner can:

1. Summarise what types of information are needed for the document and how they should be linked or integrated
2. Use appropriate techniques to enter text and other types of information accurately and efficiently
3. Create, use and modify appropriate templates for different types of documents
4. Explain how to combine and merge information from other software or multiple documents
5. Combine and merge information within a document from a range of sources
6. Store and retrieve document and associated files effectively, in line with local guidelines and conventions where available
7. Select and use tools and techniques to work with multiple documents or users
8. Customise interface to meet needs

### **Outcome 2 Be able to create and modify appropriate layouts, structures and styles for word processing documents**

The learner can:

1. Analyse and explain the requirements for structure and style
2. Create, use and modify columns, tables and forms to organise information
3. Define and modify styles for document elements
4. Select and use tools and techniques to organise and structure long documents

### **Outcome 3 Be able to use word processing software tools and techniques to format and present documents effectively to meet requirements**

The learner can:

1. Explain how the information should be formatted to aid meaning
2. Select and use appropriate techniques to format characters and paragraphs
3. Select and use appropriate page and section layouts to present and print multi-page and multi-section documents
4. Check documents meet needs, using IT tools and making corrections as necessary
5. Evaluate the quality of the documents produced to ensure they are fit for purpose
6. Respond appropriately to any quality problems with documents to ensure that outcomes meet needs and are fit for purpose

**Level:** 3  
**Credit value:** 5  
**UAN:** H/502/4567

**Unit aim**

The aim of this unit is to teach the learner to produce effective publications using desktop publishing software. In order to do this the learner will describe the information they will use to produce a document and provide guidance on the use of this information in terms of legislation and copyright. The learner will also learn to combine their text with other information to produce professional presentations. Lastly the learner will use what they have learnt to produce and edit a publication that is fit for purpose.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to select and use appropriate designs and page layouts for publications
2. Be able to input and combine text and other information within publications
3. Be able to use desktop publishing software techniques to edit and format publications

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **40** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-379 Desktop publishing software

## Assessment Criteria

### **Outcome 1 Be able to select and use appropriate designs and page layouts for publications**

The learner can:

1. Explain what types of information are needed
2. Explain when and how to change page design and layout to increase effectiveness of a publication
3. Select, change, define, create and use appropriate page design and layout for publications in line with local guidelines, where relevant
4. Select and use appropriate media for the publication

### **Outcome 2 Be able to input and combine text and other information within publications**

The learner can:

1. Find and input information into a publication so that it is ready for editing and formatting
2. Organise and combine information for publications in line with any copyright constraints, including importing information produced using other software
3. Provide guidance on how copyright constraints affect use of own and others' information
4. Explain which file format to use for saving designs and images
5. Store and retrieve publication files effectively, in line with local guidelines and conventions where available

### **Outcome 3 Be able to use desktop publishing software techniques to edit and format publications**

The learner can:

1. Determine and discuss what styles, colours, font schemes, editing and formatting to use for the publication
2. Create styles, colours and font schemes to meet needs
3. Select and use appropriate techniques to edit publications and format text
4. Manipulate images and graphic elements accurately
5. Control text flow within single and multiple columns and pages
6. Check publications meet needs, using IT tools and making corrections as necessary
7. Identify and respond appropriately to quality problems with publications to ensure that outcomes are fit for purpose and meet needs

**Level:** 3  
**Credit value:** 5  
**UAN:** A/502/4574

**Unit aim**

The aim of this unit is to teach the learner to use design software to produce professional designs. In order to do this the learner will describe what designs are needed whilst describing what copyrights and constraints apply to their designs. The learner will also use design software to create, manipulate and edit designs. They will be able to identify and respond to quality problems with designs also confirming designs are fit for purpose.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to obtain, insert and combine information for designs
2. Be able to use design software tools to create, manipulate and edit designs

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **40** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

## **Unit 4520-380      Design software**

### Assessment Criteria

#### **Outcome 1      Be able to obtain, insert and combine information for designs**

The learner can:

1. Explain what designs are needed
2. Explain how the context affects the way designs should be prepared
3. Provide guidance on what and how any copyright or other constraints may apply to the use of own and others' designs
4. Obtain, insert and prepare designs
5. Explain how file format affects design quality, format and size and how to choose appropriate formats for saving designs
6. Use appropriate techniques to organise and combine information of different types or from different sources
7. Store and retrieve files effectively, in line with guidelines and conventions where available

#### **Outcome 2      Be able to use design software tools to create, manipulate and edit designs**

The learner can:

1. Explain what technical factors affecting designs needs to be taken into account and how to do so
2. Select and use suitable tools and techniques efficiently to create designs
3. Use guide lines and dimensioning tools appropriately to enhance precision
4. Select and use appropriate tools and techniques to manipulate and edit designs
5. Check designs meet needs, using IT tools and making corrections as necessary
6. Identify and respond appropriately to quality problems to ensure that outcomes are fit for purpose and meet needs

**Level:** 3  
**Credit value:** 10  
**UAN:** F/502/8982

**Unit aim**

The aim of this unit is to teach the learner the required underpinning knowledge in order for them to pass the Cisco Passport21 Aspire unit. The learner will learn to manage a virtual business, including looking at different types of advertising media, and managing business resources. The learner will also learn how to manage an IP based system for a virtual business.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to manage a virtual business
2. Be able to manage an IP based system for a virtual business

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by the related course activities.

# Unit 4520-381 Cisco Passport21 Aspire

## Assessment Criteria

### **Outcome 1 Be able to manage a virtual business**

The learner can:

1. Select a business strategy based on personal objectives
2. Identify a range products and services to offer to customers
3. Define target market
4. Investigate different types of advertising media
5. Evaluate Internet service provider based on requirements
6. Implement budgeting decisions based on social criteria
7. Manage the start-up of a business
8. Manage a business during changing business conditions
9. Manage customer expectations
10. Manage business resources

### **Outcome 2 Be able to manage an IP based system for a virtual business**

The learner can:

1. Identify application layer protocols
2. Implement a virtual Ethernet network
3. Implement IP addresses
4. Implement a virtual wireless network
5. Manage virtual wireless network security
6. Test and troubleshoot virtual wireless issues
7. Test and troubleshoot virtual default gateway settings
8. Test and troubleshoot classed network subnet mask settings
9. Identify virtual collision and broadcast domains
10. Test and troubleshoot virtual network client configurations
11. Evaluate correct switch or router requirements
12. Upgrade a virtual switch or router
13. Implement a multiple network configuration
14. Implement a virtual interior routing protocol
15. Test and troubleshoot virtual network connectivity
16. Test and troubleshoot subnet mask errors
17. Plan and manage the subnetting of a network

**Level:** 3  
**Credit value:** 10  
**UAN:** Y/502/8972

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the Cisco Voice exam. In order to do this the learner will learn the principles of voice systems including VoIP and PSTN. They will also learn how implement a voice system using Cisco architecture and they will learn how to maintain a voice system.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand the principles of voice systems
2. Be able to manage the implementation of a voice system
3. Be able to maintain a voice solution

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed using the relevant CISCO test.

# Unit 4520-382 Cisco Voice

## Assessment Criteria

### **Outcome 1 Understand the principles of voice systems**

The learner can:

1. Describe the components of the Cisco Unified Communications Architecture
2. Describe VoIP components and technologies
3. Describe and configure gateways, voice ports, and dial peers to connect to the PSTN and service provider network
4. Describe and configure a Cisco network to support VoIP
5. Describe PSTN components and technologies

### **Outcome 2 Be able to manage the implementation of a voice system**

The learner can:

1. Plan and Implement UC500 using Cisco Configuration Assistant
2. Plan and Implement Cisco Unified Communications Manager Express to support endpoints using CLI
3. Plan and Implement voicemail features using Cisco Unity Express

### **Outcome 3 Be able to maintain a voice solution**

The learner can:

1. Perform maintenance and operations tasks to support the VoIP solution

**Level:** 3  
**Credit value:** 20  
**UAN:** H/502/8991

**Unit aim**

The aim of this unit to teach the learner the underpinning knowledge required for the Cisco Passport 21 Entrepreneurship unit. In order to complete this unit the learner will learn how to charge for expertise, through identifying skills that have value in the workplace, they will also learn how to start an Internet café, and the requirements for making a business plan as well as understanding contracts.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Understand charging for expertise
2. Be able to start an internet café
3. Understand the requirements for making a business successful
4. Understand the requirements for providing outsource services
5. Understand the requirements for building a contracting business

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **140** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by the related course outcomes

# Unit 4520-383 Cisco Passport 21 Entrepreneurship

## Assessment Criteria

### **Outcome 1 Understand charging for expertise**

The learner can:

1. Identify skills that have value in the marketplace
2. Explain the social, legal, and ethical responsibilities of an entrepreneur
3. Describe the ways in which a business receives income
4. Describe the basic elements of a customer sales presentation
5. Manage business records
6. Explain tools that businesses use to grow

### **Outcome 2 Be able to start an internet café**

The learner can:

1. Investigate common business terminology
2. Identify and research a business opportunity
3. Explain the decision making process
4. Implement the decision making process
5. Work as part of a business team
6. Prepare a simplified business plan

### **Outcome 3 Understand the requirements for making a business successful**

The learner can:

1. Investigate common marketing terminology
2. Explain variances in sales and cost forecasting
3. Identify frequently used marketing and communication tools
4. Analyze research results
5. Explain the change process
6. Prepare a simplified growth plan

### **Outcome 4 Understand the requirements for providing outsource services**

The learner can:

1. Investigate the role of a contractor
2. Explain how a contractor builds relationships with other businesses
3. investigate how relationships are managed using contracts
4. Investigate how to find companies that are looking for contractors
5. Explain how to contact potential customers

### **Outcome 5 Understand the requirements for building a contracting business**

The learner can:

1. Review current business commitments and resources
2. Identify needed resources
3. Define a business structure to organize and optimize resources
4. Develop ways to communicate within the business structure
5. Explain the importance of good financial management
6. Investigate expansion opportunities

**Level:** 3  
**Credit value:** 10  
**UAN:** L/502/8984

**Unit aim**

The aim of this unit to teach the learner the underpinning knowledge required for the Cisco Passport 21 Entrepreneurship unit. In order to do this the learner will learn to define the role of contractors, and explain how to build relationships. They will also learn to understand the requirement's for a building contracting.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Understand the requirements for providing outsource services
2. Understand the requirements for building a contracting business

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by the related course outcomes

# **Unit 4520-384 Cisco Passport 21 Braodband**

## Assessment Criteria

### **Outcome 1 Understand the requirements for providing outsource services**

The learner can:

1. Define the role of a contractor
2. Explain how a contractor builds relationships with other businesses
3. Define these relationships using contracts
4. Investigate how to find companies that are looking for contractors
5. Explain how to contact potential customers

### **Outcome 2 Understand the requirements for building a contracting business**

The learner can:

1. Review current business commitments and resources
2. Identify needed resources
3. Define a business structure to organize and optimize resources
4. Develop ways to communicate within the business structure
5. Explain the importance of good financial management
6. Investigate expansion opportunities

**Level:** 3  
**Credit value:** 10  
**UAN:** R/502/897

**Unit aim**

The aim of this unit to teach the learner the underpinning knowledge required for the Cisco Security unit. In order to do this the learner will learn the principles of security on a modern network infrastructure. They will also learn to configure a network and know who to maintain it.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand the principles of network infrastructure security
2. Be able to configure a secure network infrastructure
3. Be able to maintain a secure network infrastructure

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by the related course outcomes

## **Unit 4520-385 Cisco security**

### Assessment Criteria

#### **Outcome 1 Understand the principles of network infrastructure security**

The learner can:

1. Describe the security threats facing modern network infrastructures

#### **Outcome 2 Be able to configure a secure network infrastructure**

The learner can:

1. Secure network device access
2. Implement AAA on network devices
3. Mitigate threats to networks using ACLs
4. Implement secure network management and reporting Mitigate common Layer 2 attacks
5. Implement the Cisco IOS firewall feature set
6. Implement the Cisco IOS IPS feature set
7. Implement site-to-site IPSec VPNs

#### **Outcome 3 Be able to maintain a secure network infrastructure**

The learner can:

1. Administer effective security policies

**Level:** 3  
**Credit value:** 20  
**UAN:** K/502/8992

**Unit aim**

Refer to CompTIA learning materials.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to manage Convergent Networks
2. Be able to manage Voice Technologies
3. Be able to support Convergence Technologies

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **140** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be assessed by vendor certification.

# Unit 4520-386      Certification Partners CompTIA CTP+

## Assessment Criteria

### **Outcome 1    Be able to manage Convergent Networks**

The learner can:

1. Investigate current networking models and standards in the context of converged networking practice.
2. Identify appropriate local area network/wide area network (LAN/WAN) infrastructures.
3. Plan an Internet Protocol based network.
4. Describe wireless networks.
5. Troubleshoot convergent networks.
6. Identify elements and benefits of a virtual LAN
7. Investigate Quality of Service requirements

### **Outcome 2    Be able to manage Voice Technologies**

The learner can:

1. Investigate codecs and Pulse Code Modulation
2. Investigate Integrated Services Digital Network elements and concepts.
3. Identify common voice services and feature sets.
4. Identify and troubleshoot problems with voice calls in digital and analog environments.

### **Outcome 3    Be able to support Convergence Technologies**

The learner can:

1. Identify essential elements of a convergent network.
2. Identify requirements for transporting text, voice, video, modem and fax through a converged solution.
3. Identify methods for providing video services through a converged solution.
4. Explain how protocols control convergent network traffic.
5. Identify common convergence devices.
6. Troubleshoot common convergence technology.
7. Identify security issues for converged networks

**Level:** 3  
**Credit value:** 10  
**UAN:** D/502/8973

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the appropriate exam for this unit. In order to do this, learners will learn to manage shells, scripting and data management within a Linux environment. Learners will also learn to manage interfaces and administrative tasks. Learners will also learn to network and make secure a Linux operating system.

**Learning outcomes**

There are **seven** learning outcomes to this unit. The learner will:

1. Understand systems supporting 'Shells, Scripting and Data management'
2. Be able to manage user interfaces and desktops
3. Be able to manage Linux based Administrative Tasks
4. Be able to manage Linux Essential System Services
5. Understand networking fundamentals
6. Be able to manage Linux based security

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by Portfolio of evidence.

**Assessment Criteria****Outcome 1 Understand systems supporting ‘Shells, Scripting and Data management’**

The learner can:

1. Customise and use the shell environment
2. Customise or write simple scripts
3. Implement SQL data management

**Outcome 2 Be able to manage user interfaces and desktops**

The learner can:

1. Install and configure X11
2. Configure a display manager
3. Be able to manipulate access

**Outcome 3 Be able to manage Linux based Administrative Tasks**

The learner can:

1. Manage user and group accounts and related system files.
2. Automate system administration tasks by scheduling jobs
3. Understand the processes to localise systems and settings

**Outcome 4 Be able to manage Linux Essential System Services**

The learner can:

1. Maintain system time
2. Manage System Logging
3. Understand Mail Transfer Agent (MTA) basics
4. Manage Printers and Printing

**Outcome 5 Understand networking fundamentals**

The learner can:

1. Understand the fundamentals of internet Protocols
2. Manage basic network troubleshooting
3. Configure client side Domain Name Services (DNS)s

**Outcome 6 Be able to manage Linux based security**

The learner can:

1. Perform security administration tasks
2. Configure host security
3. Secure data with encryption

**Level:** 3  
**Credit value:** 10  
**UAN:** Y/502/9006

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the CIW JavaScript Specialist exam. In order to do this the learner will learn how to understand the principles of JavaScript including how to embed JavaScript into HTML and use scripting commands. The learner will also learn functional programming and object oriented programming using JavaScript. Lastly they will learn how websites interact with JavaScript.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand JavaScript principles
2. Understand functional programming using JavaScript
3. Understand object oriented programming using JavaScript
4. Understand how web sites interact with JavaScript

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using the approved CIW examination

# Unit 4520-389      CIW JavaScript specialist

## Assessment Criteria

### **Outcome 1      Understand JavaScript principles**

The learner can:

1. Identify key JavaScript elements
2. Critically compare JavaScript with other scripting languages
3. Investigate the differences between client side and server side applications
4. Embed JavaScript into HTML
5. Define JavaScript Data Types and variables
6. Use expressions, operators, concatenation and addition
7. Use scripting commands
8. Define operator precedence

### **Outcome 2      Understand functional programming using JavaScript**

The learner can:

1. Explain how to use JavaScript functions
2. Manage the transfer of data between functions
3. Manage the use of global and local variables

### **Outcome 3      Understand object oriented programming using JavaScript**

The learner can:

1. Explain the JavaScript object model
2. Create and deploy JavaScript objects
3. Manage the passing of data between different JavaScript objects

### **Outcome 4      Understand how web sites interact with JavaScript**

The learner can:

1. Explain the use of form objects in JavaScript
2. Use form objects when building web applications
3. Manage the use of cookies in web applications
4. Use functions and variables within framesets and related windows
5. Create and manipulate client-side databases

**Level:** 3  
**Credit value:** 10  
**UAN:** R/502/9005

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the CIW database design exam. In order to do this the learner will learn to understand relationship databases and the design of relational databases. They will also learn to normalise a database as well as learning to implement SQL and Relational Algebra. Lastly the learner will be taught how to manage database transactions and security.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand relational database fundamentals
2. Understand relational database design
3. Be able to normalize a database
4. Be able to implement the structured query language
5. Be able to implement relational algebra
6. Be able to manage database transactions and security

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using the approved CIW examination

# Unit 4520-390 CIW database design

## Assessment Criteria

### **Outcome 1 Understand relational database fundamentals**

The learner can:

1. Identify basic database types and management systems
2. Evaluate common database languages and their purposes, and identify language subsets of Structured Query Language (SQL)
3. Identify relational data modelling schemas, characteristics and manipulation

### **Outcome 2 Understand relational database design**

The learner can:

1. Identify the steps of the database planning life cycle
2. Identify the activities in the conceptual design phase of a database

### **Outcome 3 Be able to normalize a database**

The learner can:

1. Design a database using normalisation
2. Describe logical database design steps and practices
3. Apply normalization techniques and processes

### **Outcome 4 Be able to implement the structured query language**

The learner can:

1. Identify SQL commands and syntax
2. Design and implement statements using Data Definition Language (DDL)
3. Implement Form commands using Data Manipulation Language
4. Manage the use of Data Control Language statements

### **Outcome 5 Be able to implement relational algebra**

The learner can:

1. Design relational algebra to improve database design
2. Implement joins in a database

### **Outcome 6 Be able to manage database transactions and security**

The learner can:

1. Develop transactions and currency control
2. Manage database security elements

**Level:** 3  
**Credit value:** 10  
**UAN:** D/502/9007

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the CIW Internet Business Foundations exam. In order to do this the learner will learn to understand IT roles. They will learn to understand web technology requirements for business, and they will also be able to manage client side requirements. The learner will be able to manage web-based communication.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand IT roles
2. Understand web technology requirements
3. Be able to manage client side requirements
4. Be able to manage web based communication

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using the approved CIW examination

# **Unit 4520-391      CIW Internet business foundations**

## Assessment Criteria

### **Outcome 1      Understand IT roles**

The learner can:

1. Identify current job roles
2. Identify current job role responsibilities
3. Evaluate current jobs tasks and skills requirement

### **Outcome 2      Understand web technology requirements**

The learner can:

1. Investigate current Internet hardware
2. Investigate current protocols
3. Investigate current communications systems
4. Explain the principles of DNS

### **Outcome 3      Be able to manage client side requirements**

The learner can:

1. Manage the use and customisation of web browser resources
2. Manage the use of email resources
3. Manage the use of Internet search engines

### **Outcome 4      Be able to manage web based communication**

The learner can:

1. Investigate current web based security issues
2. Manage synchronous web based communication
3. Manage asynchronous web based communication
4. Manage web database and data exchange
5. Investigate current cloud computing and virtualisation developments

**Level:** 3  
**Credit value:** 10  
**UAN:** M/502/9013

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the CIW Perl Fundamentals exam. In order to do this the learner will learn to understand the principles of PERL, including the uses and operation of the PERL interpreter. The learner will also learn to manipulate data using PERL and manage external data.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand PERL principles
2. Be able to manipulate data using Perl
3. Be able to manage external data

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using the approved CIW examination

# Unit 4520-392      CIW Perl fundamentals

## Assessment Criteria

### **Outcome 1    Understand PERL principles**

The learner can:

1. Investigate the uses and operation of the Perl Interpreter
2. Direct program flow using statements, loops and Boolean expressions
3. Implement subroutines, packages and modules
4. Create and amend object oriented code
5. Use subroutines to make code more logical and easier to debug

### **Outcome 2    Be able to manipulate data using Perl**

The learner can:

1. Use regular expressions to search and manipulate strings
2. Use arrays to store and manipulate program data
3. Manage program data with keys and hashes

### **Outcome 3    Be able to manage external data**

The learner can:

1. Manage external data in files
2. Use packages and modules to organise, reuse and export program code
3. Manage external database data using Perl modules and SQL
4. Use Perl debugging features to identify programming errors

**Level:** 3  
**Credit value:** 30  
**UAN:** T/502/9014

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the CIW Web Foundations Associate exam. In order to do this the learner will learn to understand how business can be carried out using the Internet. They will also learn website development foundations and Internet technology.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand Internet business foundations
2. Understand site development foundations
3. Understand network technology foundations

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **180** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using the approved CIW examination

# **Unit 4520-393      CIW Web foundations associate**

## Assessment Criteria

### **Outcome 1      Understand Internet business foundations**

The learner can:

1. Identify IT Job Roles
2. Define hardware and software for Internet communication
3. Identify common issues with web based communication
4. Manage web based communication
5. Evaluate a range of web database and integration resources

### **Outcome 2      Understand site development foundations**

The learner can:

1. Evaluate web site style requirements
2. Manage the implementation of a web site using HTML and XHTML
3. Manage the implementation of a web site using XML
4. Critically evaluate websites using productivity tools
5. Manage the promotion of a website
6. Manage a web server environment
7. Manage a web sites e-commerce activities

### **Outcome 3      Understand network technology foundations**

The learner can:

1. Define hardware, software and communications requirements of a network infrastructure
2. Manage the addressing requirements of a networked system
3. Manage the web based client server relationship
4. Maintain a web server
5. Investigate virtualisation technologies
6. Investigate issues with privacy on a network infrastructure

**Level:** 3  
**Credit value:** 10  
**UAN:** D/502/9010

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the CIW Site Development Foundations exam. In order to do this the learner will learn to create web pages incorporating different features and functions, learners will also learn web enhancements and manage the e-commerce requirements of a website.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to create a web page
2. Understand web site enhancements
3. Be able to manage the e-commerce requirements of a website

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using the approved CIW examination

# **Unit 4520-394      CIW Site development foundations**

## Assessment Criteria

### **Outcome 1      Be able to create a web page**

The learner can:

1. Manage the creation of a web page
2. Manage the inclusion of images
3. Manage the creation of forms
4. Manage the colour scheme of a web site
5. Manage the implementation of XML/HTML/XHTML
6. Manage the implementation of style sheets

### **Outcome 2      Understand web site enhancements**

The learner can:

1. Investigate current multimedia technology
2. Manage a web site using GUI based software
3. Critically test the functionality of a website

### **Outcome 3      Be able to manage the e-commerce requirements of a website**

The learner can:

1. Plan the deployment of a web site
2. Investigate current e-commerce resources
3. Manage database connectivity
4. Manage the end user experience
5. Investigate the issues in managing a e-commerce site

**Level:** 3  
**Credit value:** 10  
**UAN:** K/502/9009

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for the learner to sit the CIW Network Technology Foundations exam. In order to do this the learner will learn to implement network communications using different technologies. They will also learn to support networking resources, including investigating current virtualisation technology.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to implement network communication principles
2. Be able to support networking resources

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using the approved CIW examination.

# Unit 4520-395 CIW network technology foundations

## Assessment Criteria

### **Outcome 1 Be able to implement network communication principles**

The learner can:

1. Investigate current Internet technology
2. Investigate current Internet communication protocols
3. Design a networking addressing scheme
4. Manage the colour scheme of a web site
5. Manage the implementation of XML/HTML/XHTML
6. Manage the implementation of style sheets

### **Outcome 2 Be able to support networking resources**

The learner can:

1. Investigate current server technology
2. Investigate current network security practice
3. Manage the maintenance of network based hardware
4. Manage a network based operating system
5. Support a wireless network environment
6. Investigate current virtualisation technology
7. Investigate current network privacy issues

**Level:** 3  
**Credit value:** 10  
**UAN:** R/502/9019

**Unit outcome**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the CIW Security Essentials exam. In order to do this the learner will learn to understand the principles of networks, including access control and security threat types. They will also learn network encryption, how to implement network security and how to understand and implement firewall solutions.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand network security principles
2. Understand encryption
3. Be able to implement network security
4. Be able to protect a networked environment
5. Understand firewall solutions
6. Be able to implement a firewall solution

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using the approved CIW examination.

# Unit 4520-396 CIW security essentials

## Assessment Criteria

### **Outcome 1 Understand network security principles**

The learner can:

1. Identify various security policy elements
2. Identify risk factors
3. Identify security-related organizations,
4. Manage key resources to secure
5. Manage general security threat types
6. Manage access control

### **Outcome 2 Understand encryption**

The learner can:

1. Identify current encryption technologies
2. Plan the implementation of internetwork encryption
3. Manage the implementation of internetwork encryption
4. Evaluate the implementation of internetwork encryption

### **Outcome 3 Be able to implement network security**

The learner can:

1. Plan the implementation of a network security solution
2. Manage the implementation of a network security solution
3. Evaluate the implementation of a network security solution

### **Outcome 4 Be able to protect a networked environment**

The learner can:

1. Review the security of a networked environment
2. Monitor a networked system
3. Identify a network security attack
4. Manage the protection of a networked security

### **Outcome 5 Understand firewall solutions**

The learner can:

1. Identify firewall types and technologies
2. Identify current firewall solutions

### **Outcome 6 Be able to implement a firewall solution**

The learner can:

1. Design a multi-level firewall system
2. Design a multi-level firewall system
3. Evaluate the implementation of a multi-level firewall system

**Level:** 3  
**Credit value:** 10  
**UAN:** R/502/8968

### Unit aim

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the Linux Professional Institute 201 exam. In order to do this the learner will learn to understand the core elements of the Linux Kernel. They will also manage system start-up, file systems and devices as well as learning to configure a Linux network configuration. Lastly the learner will implement a Linux domain name server.

### Learning outcomes

There are **seven** learning outcomes to this unit. The learner will:

7. Understand core elements of the Linux Kernel
8. Be able to manage system start-up
9. Be able to manage the Linux file system and devices
10. Be able to manage the advanced storage device administration
11. Be able to manage Linux networking configuration
12. Be able to support system maintenance
13. Be able to implement a Linux domain name server

### Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

### Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

### How is this unit assessed?

Must be examined by the related LPI certification.

# Unit 4520-397      Linux Professional Institute 201

## Assessment Criteria

### **Outcome 1      Understand core elements of the Linux Kernel**

The learner can:

4. Identify Kernel Components
5. Compile a Kernel
6. Patch a Kernel
7. Customise, build and install a custom kernel and kernel modules
8. Manage/Query kernel and kernel modules at runtime

### **Outcome 2      Be able to manage system start-up**

The learner can:

4. Customise system startup and boot processes
5. Manage System recovery

### **Outcome 3      Be able to manage the Linux file system and devices**

The learner can:

4. Manage the Linux filesystem
5. Maintain a Linux filesystem
6. Implement udev Device Management
7. Creating and configuring filesystem options

### **Outcome 4      Be able to manage the advanced storage device administration**

The learner can:

5. Configure RAID
6. Manage Storage Device Access
7. Manage the Logical Volume Manager

### **Outcome 5      Be able to manage Linux networking configuration**

The learner can:

4. Implement Basic networking configuration
5. Implement Advanced Network Configuration
6. Troubleshoot network issues
7. Support users on system-related issues

### **Outcome 6      Be able to support system maintenance**

The learner can:

4. Make and install programs from source
5. Support Backup operation

### **Outcome 7      Be able to implement a Linux domain name server**

The learner can:

1. Implement Basic DNS server configuration
2. Create and maintain DNS zone
3. Secure a DNS server

**Level:** 3  
**Credit value:** 10  
**UAN:** L/502/8970

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the Linux Professional Institute 202 exam. In order to this the learner will learn to manage web services, manage file sharing services, how to manage network clients and system security and how to configure and manage Email services. Lastly the learner will learn how to troubleshoot Linux technologies.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Be able to manage web services
2. Be able to manage file sharing services
3. Be able to manage network clients
4. Be able to manage email services
5. Be able to manage system security
6. Understand Linux troubleshooting technologies

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related LPI certification.

# Unit 4520-398 Linux Professional Institute 202

## Assessment Criteria

### **Outcome 1 Be able to manage web services**

The learner can:

1. Implement a web server
2. Maintain a web server
3. Implement a proxy server

### **Outcome 2 Be able to manage file sharing services**

The learner can:

1. Configure a SAMBA Server
2. Configure a NFS Server

### **Outcome 3 Be able to manage network clients**

The learner can:

1. Configure DHCP
2. Implement PAM authentication
3. Support LDAP client usage

### **Outcome 4 Be able to manage email services**

The learner can:

1. Manage email servers
2. Manage Local Email Delivery
3. Manage Remote Email Delivery

### **Outcome 5 Be able to manage system security**

The learner can:

1. Configure a Linux router
2. Secure FTP servers
3. Implement Secure shell (SSH)
4. Manage TCP Wrapper
5. Implement Linux based Security tasks

### **Outcome 6 Understand Linux troubleshooting technologies**

The learner can:

1. Identify boot stages
2. manage the troubleshooting bootloaders
3. Manage the Support of General troubleshooting
4. Manage the Troubleshooting system resources
5. Manage the Troubleshooting environment configurations

**Level:** 3  
**Credit value:** 10  
**UAN:** D/502/8973

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the CompTIA and Linux Professional Institute Certification 102 exam. In order to do this the learner will learn to understand Linux systems, including shells and scripting, learn to manage interfaces, desktops and administrative tasks. They will also learn to understand networking fundamentals and Linux based security.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand systems supporting 'Shells, Scripting and Data management'
2. Be able to manage user interfaces and desktops
3. Be able to manage Linux based administrative tasks
4. Be able to manage Linux Essential System Services
5. Understand networking fundamentals
6. Be able to manage Linux based security

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Should be assessed using the approved CompTIA/Linux Professional Institute examination.

**Assessment Criteria****Outcome 1 Understand systems supporting ‘Shells, Scripting and Data management’**

The learner can:

1. Customise and use the shell environment
2. Customise or write simple scripts
3. Implement SQL data management

**Outcome 2 Be able to manage user interfaces and desktops**

The learner can:

1. Install and configure X11
2. Configure a display manager
3. Be able to manipulate access

**Outcome 3 Be able to manage Linux based administrative tasks**

The learner can:

1. Manage user and group accounts and related system files.
2. Automate system administration tasks by scheduling jobs
3. Understand the processes to localise systems and settings

**Outcome 4 Be able to manage Linux Essential System Services**

The learner can:

1. Maintain system time
2. Manage System Logging
3. Understand Mail Transfer Agent (MTA) basics
4. Manage Printers and Printing

**Outcome 5 Understand networking fundamentals**

The learner can:

1. Understand the fundamentals of internet Protocols
2. Manage basic network troubleshooting
3. Configure client side Domain Name Services (DNS)

**Outcome 6 Be able to manage Linux based security**

The learner can:

1. Perform security administration tasks
2. Configure host security
3. Secure data with encryption

**Level:** 3  
**Credit value:** 20  
**UAN:** J/502/8966

**Unit aim**

The aim of this unit is to teach the learner the underpinning knowledge required for them to sit the VM Ware Certified Professional exam. In order to do this the learner will learn how to plan, install and upgrade VMware, how to configure networking and storage within a virtual machine and how to deploy and manage virtual machines and vApps, as well as establishing service levels and troubleshooting systems.

**Learning outcomes**

There are **eight** learning outcomes to this unit. The learner will:

1. Understand how to plan, install and upgrade VMware ESX/ESXi
2. Be able to configure ESX/ESXi Networking
3. Be able to configure ESX/ESXi Storage
4. Be able to install and configure vCenter Server
5. Be able to deploy and manage virtual machines and vApps
6. Be able to manage vCenter compliance
7. Be able to establish vCenter service levels
8. Be able to perform troubleshooting and alarm management

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **140** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related VM Ware Certified Professional certification.

# Unit 4520-400 VM Ware Certified Professional

## Assessment Criteria

### **Outcome 1 Understand how to plan, install and upgrade VMware ESX/ESXi**

The learner can:

1. Install VMware ESX/ESXi on local storage
2. Upgrade VMware ESX/ESXi
3. Secure VMware ESX/ESXi
4. Install VMware ESX/ESXi on SAN Storage
5. Identify vSphere Architecture and Solutions

### **Outcome 2 Be able to configure ESX/ESXi Networking**

The learner can:

1. Configure Virtual Switches
2. Configure vNetwork Distributed Switches
3. Configure VMware ESX/ESXi Management Network

### **Outcome 3 Be able to configure ESX/ESXi Storage**

The learner can:

1. Configure FC SAN Storage
2. Configure iSCSI SAN Storage
3. Configure NFS Datastores
4. Configure and Manage VMFS Data stores

### **Outcome 4 Be able to install and configure vCenter Server**

The learner can:

1. Install vCenter Server
2. Manage vSphere Client plug-ins
3. Configure vCenter Server
4. Configure Access Control

### **Outcome 5 Be able to deploy and manage virtual machines and vApps**

The learner can:

1. Be able to Deploy and Manage Virtual Machines and vApps
2. Manage Virtual Machines
3. Implement the deployment of vApps

### **Outcome 6 Be able to manage vCenter compliance**

The learner can:

1. Install, Configure and Manage VMware vCenter Update Manager
2. Establish and Apply ESX Host Profiles

## **Outcome 7 Be able to establish vCenter service levels**

The learner can:

1. Create and Configure VMware Clusters
2. Enable a Fault Tolerant Virtual Machine
3. Create and Configure Resource Pools
4. Migrate Virtual Machines
5. Backup and Restore Virtual Machines

## **Outcome 8 Be able to perform troubleshooting and alarm management**

The learner can:

1. Perform Troubleshooting for ESX/ESXi Hosts
2. Perform Troubleshooting for VMware FT and Third- Party Clusters
3. Perform Troubleshooting for Networking
4. Perform Troubleshooting for Storage
5. Perform Troubleshooting for HA/DRS and VMotion
6. Create and Respond to vCenter Connectivity Alarms
7. Create and Respond to vCenter Utilization Alarms
8. Monitor vSphere ESX/ESXi and Virtual Machine Performance

**Level:** 4  
**Credit value:** 12  
**UAN:** K/601/3502

**Unit aim**

The aim of this unit is to encourage the learner to reflect on themselves, their skills and where they fit within an organisation. In order to do this the learner will have an opportunity to identify their own development needs by, not only looking at themselves, but asking others to look at them. The learner will also manage their own development and reflect critically on their own learning. They will learn to effectively manage their own and others time and identify obstacles for effective teamwork. The learner will learn to understand what is meant by professional practice as well as learning about any ethical and legislative issues that effect their working environment. Lastly the learner will have an opportunity to look at how they might be able to improve on organisational effectiveness, by looking at any improvements to working practices that could be made.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to develop own personal and professional skills
2. Be able to work as a member of a team to achieve defined goals and implement agreed plans
3. Understand what is meant by professional practice
4. Understand the ethical and legislative environment relating to IT activities
5. Be able to improve organisational effectiveness

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-404      Develop own effectiveness and professionalism**

## Assessment Criteria

### **Outcome 1      Be able to develop own personal and professional skills**

The learner can:

1. identify own development needs and the activities needed to meet them
2. obtain and interpret feedback from others on performance
3. set and agree personal goals and participate in development activities to meet them
4. manage own personal/professional development in order to achieve career and personal goals
5. reflect critically on own learning

### **Outcome 2      Be able to work as a member of a team to achieve defined goals and implement agreed plans**

The learner can:

1. effectively plan and manage own and others time
2. recognise and respect diversity, individual differences and perspectives
3. accept and provide feedback in a constructive and considerate manner
4. understand the responsibilities, interests and concerns of colleagues
5. understand the role of the individual and teams in an IT organisation
6. identify and resolve obstacles to effective teamwork

### **Outcome 3      Understand what is meant by professional practice**

The learner can:

1. Interpret the implications, and applicability for IT professionals of:
  - Data Protection Act
  - Computer Misuse Act
2. Describe the role of professional bodies for IT, and the benefits of membership to individuals and organisations
3. Explain the importance of quality management systems and standards for systems development

### **Outcome 4      Understand the ethical and legislative environment relating to IT activities**

The learner can:

1. Describe the types of conflicts of interest which can arise for IT professionals
2. Evaluate the impact on an IT organisation of legislation covering:
  - Processing of financial transactions
  - Health and Safety
  - Privacy, Confidentiality and Security
  - Copyright and Intellectual Property Rights

## **Outcome 5 Be able to improve organisational effectiveness**

The learner can:

1. Interpret the aims and objectives of the organisation
2. Describe the organisation's brand or image and how it can be promoted
3. Describe the organisation's structure, roles and responsibilities
4. Identify and evaluate potential improvements to organisational effectiveness

**Level:** 4  
**Credit value:** 15  
**UAN:** R/602/1772

**Unit aim**

The aim of this unit is to teach the learner how to investigate and define the requirements of their customers when looking at ICT systems. In order to do this the learner will learn how to use different methods of investigating the requirements of their customers, they will also learn how to record their findings and present them to colleagues. The learners will learn to analyse information and identify the needs and constraints in meeting the requirements of their customers.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to control the investigation of existing and proposed systems and processes
2. Be able to analyse information to identify needs and constraints

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

**Outcome 1 Be able to control the investigation of existing and proposed systems and processes**

The learner can:

1. Select and use the investigative methods which will elicit relevant information about existing and proposed systems and processes
2. Create the documentation required to record the results of investigations
3. Ensure that investigative methods are applied correctly and all relevant information is recorded using standard documentation
4. Ensure that the confidentiality of customer information is preserved
5. Provide advice and guidance to colleagues on investigation and analysis of information

**Outcome 2 Be able to analyse information to identify needs and constraints**

The learner can:

1. Explain the types of defect, and their causes which can arise in information
2. Describe methods of minimising defects in information
3. Explain how customer needs and constraints can affect the design of an ICT system
4. Analyse information to identify customer needs and priorities for:
  - data to be stored and processed
  - functionality in terms of inputs, processes and outputs
  - capacity including numbers of users, throughput, and data storage
5. Analyse information to identify customer constraints
6. Verify that identified needs, priorities and constraints meet customer requirements

**Level:** 4  
**Credit value:** 15  
**UAN:** A/602/1264

**Unit aim**

The aim of this unit is to provide the learner with the necessary skills that will enable them to provide remote support for ICT products or services. In order to do this the learner will learn to understand the role of remote support within an organisation by understanding the types of ICT products and services that can be supported. Learners will also maintain and support customer requirements whilst ensuring compliance with any organisational requirements that there may be.

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Understand the role of remote support in the organisation
2. Be able to maintain and implement customer support requirements

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

## Assessment Criteria

**Outcome 1 Understand the role of remote support in the organisation**

The learner can:

1. Describe current and anticipated ICT products or services to be supported
2. Describe organisational requirements for remote customer support for ICT products and services

**Outcome 2 Be able to maintain and implement customer support requirements**

The learner can:

1. Review and update organisational requirements for customer support
2. Handle complaints from high risk or high profile customer issues
3. Provide suggestions to prevent future reoccurrence of complaints
4. Ensure compliance with organisational requirements
5. Initiate suitable actions to deal with deficiencies in customer support provision
6. Schedule audits of working practices and work monitoring
7. Suggest improvements to the quality and efficiency of remote support operations

**Level:** 4  
**Credit value:** 15  
**UAN:** H/500/7221

**Unit aim**

The aim of this unit is to teach the learner how to understand the security threats to an IT system and the operational impact to these threats on an organisation. In order to do this the learner will learn the different protection methods for data and physical systems and they will learn to implement and maintain policies and procedures that will protect both data and physical systems from attack.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand the security threats to an IT system, their operational impact and the methods available to combat them
2. Be able to maintain and improve ICT security procedures
3. Be able to implement security procedures

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-407      Security of ICT systems

## Assessment Criteria

### **Outcome 1      Understand the security threats to an IT system, their operational impact and the methods available to combat them**

The learner can:

1. Describe the data protection methods that are relevant to the organisation
2. Describe physical security methods in use
3. Describe organisational security procedures
4. Describe types of possible security breaches and their operational impacts

### **Outcome 2      Be able to maintain and improve ICT security procedures**

The learner can:

1. Review and update security procedures
2. Ensure compliance with security procedures by scheduling security audits
3. Initiate suitable actions to deal with identified breaches of security
4. Inform colleagues of their security responsibilities and confirm their understanding at suitable intervals

### **Outcome 3      Be able to implement security procedures**

The learner can:

1. Schedule and carry out security risk assessments
2. Select appropriate security tools for the organisation or department to use

**Level:** 4  
**Credit value:** 15  
**UAN:** Y/500/7345

**Unit aim**

The aim of this unit is to teach the learner how to provide and manage technical advice and guidance. In order to this the learner will learn how to control the provision of technical support and guidance, by ensuring that policies and procedures are in place and being followed. The learner will also learn the importance of providing proactive and reactive support to users.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Be able to control the provision of technical advice and guidance
2. Be able to provide reactive technical advice and guidance to customers on a range of topics.
3. Be able to provide proactive technical advice and guidance to customers

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-410      Technical advice and guidance

## Assessment Criteria

### **Outcome 1      Be able to control the provision of technical advice and guidance**

The learner can:

1. Ensure that organisational procedures for providing technical advice and guidance are followed.
  - resolve problems
  - improve performance
2. Describe the types, sources and applicability of information which can form the basis of technical advice and guidance:
  - information from reference sources (eg manuals, handbooks, manufacturer's specifications)
  - information derived from the analysis of data (eg trend analysis, fault logs)
  - online information (eg manufacturer's websites, technical fora, discussion groups)
3. Describe the procedures and constraints which can apply to the provision of technical advice and guidance (eg escalation, commercial/contractual, legal/regulatory, information security)
4. Identify circumstances where technical advice and guidance should be provided proactively rather than reactively in response to customer requests (eg to rectify known faults, to provide new functionality)

### **Outcome 2      Be able to provide reactive technical advice and guidance to customers on a range of topics.**

The learner can:

1. Determine the purposes for which technical advice and guidance is required
2. Verify that customers are entitled to receive the requested technical advice and guidance
3. Communicate effectively with customers to elicit sufficient information to enable correct technical advice and guidance to be provided
4. Source and interpret relevant technical information to produce advice and guidance in response to customer requests
5. Communicate technical advice and guidance to customers in a format and style which meets their needs, confirming customer understanding of the information provided
6. Follow organisational procedures for responding to customer requests including the timely escalation of those for which technical advice and guidance can not be provided or does not resolve the request

### **Outcome 3      Be able to provide proactive technical advice and guidance to customers**

The learner can:

1. Identify the purposes for which the technical advice and guidance is required
2. Identify the customers, and their level of technical knowledge, to whom the technical advice and guidance should be provided
3. Develop technical advice and guidance in a format and style which takes into account the customers' level of technical knowledge
4. Follow organisational procedures for providing proactive technical advice and guidance

**Level:** 4  
**Credit value:** 15  
**UAN:** L/500/7391

**Unit aim**

The aim of this unit is to teach the learner how to provide and manage technical fault diagnosis. In order to do this the learner will learn the maintenance philosophy and processes used by an organisation. They will also learn how to interpret technical information from a range of sources and products. The learner will learn how to maintain and manage the diagnostic process and provide specialist support, as well as selecting and improving approaches to providing support. The learner will be able to implement processes required to maintain technical fault diagnosis.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand the organisation's maintenance philosophy and the methods and information it requires
2. Be able to maintain the diagnostic process and provide specialist support to others
3. Be able to select and improve approaches to remedy for non-routine faults
4. Be able to implement processes for diagnosis and remedy records

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-411      Technical fault diagnosis

## Assessment Criteria

### **Outcome 1      Understand the organisation's maintenance philosophy and the methods and information it requires**

The learner can:

1. Describe the maintenance philosophy and processes used by the organisation
2. Explain the types of diagnostic information that are commonly needed:
  - problem description
  - problem history
  - problem location
  - technical information on a specified range of products including the system under investigation
3. Explain the following diagnostic methods and give examples of their appropriate use:
  - substitution
  - replication
  - performance and functional testing
  - environment change
4. Explain how the following considerations can affect fault diagnosis.
  - minimisation of service disruption during diagnostics
  - individual responsibility and authority
  - escalation procedure
  - service level agreements
5. Interpret specialist technical information on a range of products

### **Outcome 2      Be able to maintain the diagnostic process and provide specialist support to others**

The learner can:

1. Develop diagnostic tools
2. Review and specify approved sources of diagnostic information
3. Review and specify documentation and other recording systems to support diagnosis
4. Analyse information across a wide range of faults to identify common issues
5. Review and specify processes for identifying issues such as:
  - poor product design
  - poor manufacture
  - poor performance
  - poor implementation
  - high rates of failure
6. Provide specialist guidance to support diagnosis

### **Outcome 3 Be able to select and improve approaches to remedy for non-routine faults**

The learner can:

1. Review and specify suitable remedies to rectify identified faults taking into account the following:
  - business or service impact
  - resource and skill availability
  - ease of implementation
  - cost effectiveness
  - performance
  - compatibility
  - time
  - permanence
2. Identify possible ways to prevent reoccurrence of diagnosed faults

### **Outcome 4 Be able to implement processes for diagnosis and remedy records**

The learner can:

1. Implement approaches to documenting the diagnosis activities undertaken including:
  - fault description
  - supporting information
  - diagnostic tools etc used
  - cause of fault
  - remedy selected

**Level:** 4  
**Credit value:** 15  
**UAN:** T/500/7384

**Unit aim**

The aim of this unit is to teach the learner how to work with different forms of ICT hardware and equipment. In order to this the learner will learn how to manage working practices for different ICT hardware and equipment. They will also manage and improve working practices relating to ICT hardware and equipment.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand how to manage working practices for ICT hardware and equipment
2. Be able to manage and improve working practices relating to ICT hardware and equipment
3. Be able to improve working practices to minimise risk to the organisation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-414      Working with ICT hardware and equipment**

## Assessment Criteria

### **Outcome 1      Understand how to manage working practices for ICT hardware and equipment**

The learner can:

1. Explain how to align processes with organisational objectives and customer needs
2. Explain the appropriate uses of tools and techniques
3. Explain which regulatory requirements might affect working procedures and how to take them into account

### **Outcome 2      Be able to manage and improve working practices relating to ICT hardware and equipment**

The learner can:

1. Select, adapt and use relevant tools and techniques safely
2. Create and implement working procedures relating to the use of ICT hardware and equipment
3. Obtain and allocate required materials
4. Record relevant information
5. Communicate the progress and outcome of work to the appropriate people
6. Develop documentation to support effective working practices
7. Develop tools to enable more efficient working practices
8. Contribute to the development of the organisation's work strategy

### **Outcome 3      Be able to improve working practices to minimise risk to the organisation**

The learner can:

1. Improve working practices in order to assess and minimise risks

**Level:** 4  
**Credit value:** 15  
**UAN:** R/601/3297

**Unit aim**

The aim of this unit is to teach the learner the importance of data structures and algorithms associated with data. In order to do this the learner will learn to define the terminology used and describe the elements of data structures. They will also learn to understand the operation of established algorithms and learn how to describe and implement data structures in algorithms in non-executable and executable programs.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand the structure and uses of various data structures and their associated algorithms
2. Understand the operation of established algorithms
3. Be able to select appropriate data structures and associated algorithms for specified problems
4. Be able to describe the data structures and associated algorithms in a non-executable program specification language
5. Be able to implement data structures and algorithms in an executable programming language
6. Understand how strings are structured and processed

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

**Outcome 1 Understand the structure and uses of various data structures and their associated algorithms**

The learner can:

1. Define the terminology used to describe the elements of data structures including arrays, linked lists, stacks, queues, trees, graphs and sets
2. Explain how one-dimensional and multi-dimensional arrays are structured and processed
3. Explain how linked lists (including singly, doubly and circular linked lists) are structured and processed
4. Explain how stacks and queues are structured and processed
5. Explain how trees and graphs are structured and processed
6. Explain how sets are structured and processed

**Outcome 2 Understand the operation of established algorithms**

The learner can:

1. Explain the operation and performance of sorting and search algorithms
2. Explain the operation of recursive algorithms and identify situations when recursion is used

**Outcome 3 Be able to select appropriate data structures and associated algorithms for specified problems**

The learner can:

1. Given a specified problem, choose a data structure and associated algorithm and justify the selection

**Outcome 4 Be able to describe the data structures and associated algorithms in a non-executable program specification language**

The learner can:

1. Specify the structure and associated algorithms of arrays, linked lists, stacks, queues, trees, graphs and sets in well-established specification languages
2. Specify the behaviour of sorting, searching and recursive algorithms using well-established specification languages
3. Demonstrate the operation of data-structures and algorithms by hand execution of the associated algorithms with specified test data

**Outcome 5 Be able to implement data structures and algorithms in an executable programming language**

The learner can:

1. Implement arrays, linked lists, stacks, queues, trees, graphs and sets in the context of well-defined problems in an executable programming language
2. Implement sorting, searching and recursive algorithms in the context of well-defined problems in an executable programming language
3. Demonstrate the correct operation of data structure algorithms implemented in an executable programming language by devising and executing testing strategies

## **Outcome 6 Understand how strings are structured and processed**

The learner can:

1. Explain the structure of strings
2. Identify common string operations
3. Demonstrate the outcome of string operations on specified strings

**Level:** 4  
**Credit value:** 15  
**UAN:** J/601/3300

**Unit aim**

The aim of this unit is to teach the concepts of event driven programming. In order to do this the learner will learn some of the features of an event driven environment such as using standard input and output commands and use the integrated development environment effectively. They will have an opportunity to use what they have learnt by modifying an existing program to improve its quality. The learner will test their amended code against actual and expected outcomes. Lastly the learner will develop design documentation for use in program maintenance as well as end user documentation such as a user guide.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to design event-driven programs to address loosely-defined problems
2. Be able to produce a working event-driven program which meets the design specification
3. Be able to develop event-driven programs that reflect established programming and software engineering practice
4. Be able to develop test strategies and apply these to event-driven programs
5. Be able to develop design documentation for use in program maintenance and end-user documentation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-420      Designing and developing event-driven computer programs

## Assessment Criteria

### **Outcome 1      Be able to design event-driven programs to address loosely-defined problems**

The learner can:

1. Identify and structure the components and data required to address problems
2. Select and use pre-defined components, specialising as required
3. Identify the set of events that invoke behaviour of components and other programme elements
4. Specify the behaviour of components and other program elements to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
5. Record the design using well-established notations

### **Outcome 2      Be able to produce a working event-driven program which meets the design specification**

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

### **Outcome 3      Be able to develop event-driven programs that reflect established programming and software engineering practice**

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

### **Outcome 4      Be able to develop test strategies and apply these to event-driven programs**

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program

### **Outcome 5      Be able to develop design documentation for use in program maintenance and end-user documentation**

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

**Level:** 4  
**Credit value:** 15  
**UAN:** T/601/3311

**Unit aim**

The aim of this unit is to teach the concepts of procedural programming. As part of this unit the learner will learn some of the key elements of a procedural language such as how to declare file structures and how to use some of the predefined functions. They will have an opportunity to use what they have learnt by modifying an existing program to improve its quality. They will test the revised code and record expected and actual results. Lastly the learner will develop design documentation for use in program maintenance as well as end user documentation such as a user guide.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to design procedural programs to address loosely-defined problems
2. Be able to produce a working procedural program which meets the design specification
3. Be able to develop procedural programs that reflect established programming and software engineering practice
4. Be able to develop test strategies and apply these to procedural programs
5. Be able to develop design documentation for use in program maintenance and end-user documentation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# **Unit 4520-421      Designing and developing procedural computer programs**

## Assessment Criteria

### **Outcome 1      Be able to design procedural programs to address loosely-defined problems**

The learner can:

1. Identify and structure procedures and functions to address problems
2. Select and use library functions and procedures
3. Structure the design with regard to coupling and cohesion
4. Specify the behaviour of functions and procedures to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
5. Record the design using well-established notations

### **Outcome 2      Be able to produce a working procedural program which meets the design specification**

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

### **Outcome 3      Be able to develop procedural programs that reflect established programming and software engineering practice**

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

### **Outcome 4      Be able to develop test strategies and apply these to procedural programs**

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program

### **Outcome 5      Be able to develop design documentation for use in program maintenance and end-user documentation**

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

**Level:** 4  
**Credit value:** 15  
**UAN:** J/601/3300

**Unit aim**

The aim of this unit is to teach the concepts of event driven computer programming. In order to this the learner will learn some of the key features of an object oriented environment; for example they will learn how to declare structures and use standard input and output commands. The learner will have an opportunity to use what they have learnt by refining an exiting program to improve its quality. They will test the amended program comparing actual with expected results. Lastly the learner will develop design documentation for use in program maintenance as well as end user documentation such as a user guide.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Design event-driven programs to address loosely-defined problems
2. Produce a working event-driven program which meets the design specification
3. Develop event-driven programs that reflect established programming and software engineering practice
4. Develop test strategies and apply these to event-driven programs
5. Develop design documentation for use in program maintenance and end-user documentation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by Portfolio of evidence.

**Outcome 1 Design event-driven programs to address loosely-defined problems**

The learner can:

1. Identify and structure the components and data required to address problems
2. Select and use pre-defined components, specialising as required
3. Identify the set of events that invoke behaviour of components and other programme elements
4. Specify the behaviour of components and other program elements to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
5. Record the design using well-established notations

**Outcome 2 Produce a working event-driven program which meets the design specification**

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

**Outcome 3 Develop event-driven programs that reflect established programming and software engineering practice**

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

**Outcome 4 Develop test strategies and apply these to event-driven programs**

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program:

**Outcome 5 Develop design documentation for use in program maintenance and end-user documentation**

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

**Level:** 4  
**Credit value:** 15  
**UAN:** T/601/3308

**Unit aim**

The aim of this unit is to teach the concepts of object oriented programming. In order to this the learner will learn some of the key features of an object oriented environment; for example they will learn how to declare structures and use standard input and output commands. The learner will have an opportunity to use what they have learnt by refining an exiting program to improve its quality. They will test the amended program comparing actual with expected results. Lastly the learner will develop design documentation for use in program maintenance as well as end user documentation such as a user guide.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Be able to design object-oriented programs to address loosely-defined problems
2. Be able to produce a working object-oriented program which meets the design specification
3. Be able to develop object-oriented programs that reflect established programming and software engineering practice
4. Be able to develop test strategies and apply these to object-oriented programs
5. Be able to develop design documentation for use in program maintenance and end-user documentation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio of evidence.

**Outcome 1 Be able to design object-oriented programs to address loosely-defined problems**

The learner can:

1. Identify a set of classes and their interrelationships to address the problem
2. Make effective use of encapsulation, inheritance and polymorphism
3. Select and reuse pre-existing objects and templates specialising as required
4. Structure the design so that objects communicate efficiently
5. Specify the properties and behaviour of classes to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
6. Record the design using well-established notations

**Outcome 2 Be able to produce a working object-oriented program which meets the design specification**

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

**Outcome 3 Be able to develop object-oriented programs that reflect established programming and software engineering practice**

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

**Outcome 4 Be able to develop test strategies and apply these to object-oriented programs**

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program

**Outcome 5 Be able to develop design documentation for use in program maintenance and end-user documentation**

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

**Level:** 4  
**Credit value:** 15  
**UAN:** J/601/3300

**Unit aim**

The aim of this unit is to teach the concepts of event driven computer programming. In order to this the learner will learn some of the key features of an object oriented environment; for example they will learn how to declare structures and use standard input and output commands. The learner will have an opportunity to use what they have learnt by refining an exiting program to improve its quality. They will test the amended program comparing actual with expected results. Lastly the learner will develop design documentation for use in program maintenance as well as end user documentation such as a user guide.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Design event-driven programs to address loosely-defined problems
2. Produce a working event-driven program which meets the design specification
3. Develop event-driven programs that reflect established programming and software engineering practice
4. Develop test strategies and apply these to event-driven programs
5. Develop design documentation for use in program maintenance and end-user documentation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by Portfolio of evidence.

**Outcome 1 Design event-driven programs to address loosely-defined problems**

The learner can:

1. Identify and structure the components and data required to address problems
2. Select and use pre-defined components, specialising as required
3. Identify the set of events that invoke behaviour of components and other programme elements
4. Specify the behaviour of components and other program elements to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
5. Record the design using well-established notations

**Outcome 2 Produce a working event-driven program which meets the design specification**

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

**Outcome 3 Develop event-driven programs that reflect established programming and software engineering practice**

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

**Outcome 4 Develop test strategies and apply these to event-driven programs**

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program:

**Outcome 5 Develop design documentation for use in program maintenance and end-user documentation**

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

**Level:** 4  
**Credit value:** 15  
**UAN:** T/601/3308

**Unit aim**

The aim of this unit is to teach the concepts of object oriented programming. In order to this the learner will learn some of the key features of an object oriented environment; for example they will learn how to declare structures and use standard input and output commands. The learner will have an opportunity to use what they have learnt by refining an exiting program to improve its quality. They will test the amended program comparing actual with expected results. Lastly the learner will develop design documentation for use in program maintenance as well as end user documentation such as a user guide.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Design object-oriented programs to address loosely-defined problems
2. Produce a working object-oriented program which meets the design specification
3. Develop object-oriented programs that reflect established programming and software engineering practice
4. Develop test strategies and apply these to object-oriented programs
5. Develop design documentation for use in program maintenance and end-user documentation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by Portfolio of evidence.

**Outcome 1 Design object-oriented programs to address loosely-defined problems**

The learner can:

1. Identify a set of classes and their interrelationships to address the problem
2. Make effective use of encapsulation, inheritance and polymorphism
3. Select and reuse pre-existing objects and templates specialising as required
4. Structure the design so that objects communicate efficiently
5. Specify the properties and behaviour of classes to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
6. Record the design using well-established notations

**Outcome 2 Produce a working object-oriented program which meets the design specification**

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

**Outcome 3 Develop object-oriented programs that reflect established programming and software engineering practice**

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

**Outcome 4 Develop test strategies and apply these to object-oriented programs**

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program:

**Outcome 5 Develop design documentation for use in program maintenance and end-user documentation**

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

**Level:** 4  
**Credit value:** 15  
**UAN:** L/601/3315

**Unit aim**

The aim of this of this unit is to teach the learners how to design and develop professional websites. In order to do this the learner will learn how to design websites based on customer requirements. They will also learn to use development tools and design multimedia content for a website as well as developing test strategies and understanding the need to adhere to web standards when designing and implementing websites.

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Be able to design a Web site to address loosely-defined requirements
2. Be able to use web development tools to build (X)HTML- and CSS-based websites to address well-defined specifications
3. Understand the technology and tools needed to use multimedia in the context of a website
4. Be able to develop test strategies and apply these to a Web site
5. Understand the need for Web standards
6. Understand the concepts associated with using the Internet and the World Wide Web for business

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-426      Designing and developing a website

## Assessment Criteria

### **Outcome 1      Be able to design a Web site to address loosely-defined requirements**

The learner can:

1. Identify the key design features inherent within a requirements specification
2. Use planning tools and techniques to create a site map
3. Evaluate different design models and select the most appropriate to meet requirements

### **Outcome 2      Be able to use web development tools to build (X)HTML- and CSS-based websites to address well-defined specifications**

The learner can:

1. Describe the use of (X)HTML to develop websites
2. Describe how to use CSS to standardise the overall style of a website
3. Write the source code for a simple web page in clean XHTML according to a specification
4. Write the source code for a CSS according to a specification
5. Explain the contextual application of a variety of web development tools
6. Explain the advantages and disadvantages of various web development methodologies and technologies

### **Outcome 3      Understand the technology and tools needed to use multimedia in the context of a website**

The learner can:

1. Explain the advantages and disadvantages of various types of multimedia file format
2. Explain the advantages and disadvantages of different types of multimedia element in relation to different contexts
3. Embed functional multimedia components in an (X)HTML site

### **Outcome 4      Be able to develop test strategies and apply these to a Web site**

The learner can:

1. Develop and apply a test strategy consistent with the design
2. Determine expected test results
3. Record actual test results to enable comparison with expected results
4. Analyse actual test results against expected results to identify discrepancies
5. Investigate test discrepancies to identify and rectify their causes
6. Explain the need for testing on different platforms and browsers

### **Outcome 5      Understand the need for Web standards**

The learner can:

1. Explain the role of the W3C
2. Explain W3C standards and their application in site coding
3. Discuss web accessibility and usability issues from the viewpoint of an IT professional

## **Outcome 6 Understand the concepts associated with using the Internet and the World Wide Web for business**

The learner can:

1. Explain the underlying physical and operational properties of the Internet and World Wide Web, including the difference between the two
2. Discuss the Internet and the Web as a business tool, including (but not limited to) as a tool for communications, research, sales and marketing
3. Discuss the advantages and disadvantages of various internet-based models, in different contexts
4. Discuss the advantages and disadvantages of various eCommerce models, in different contexts

**Level:** 4  
**Credit value:** 10  
**UAN:** F/601/9581

**Unit aim**

The aim of this unit is to teach the learner the knowledge required in order for them to sit the Cisco CCNP Route exam. To be able to do this the learner will learn the principles of routing services as well as being able to implement different routing solutions. They will learn how to manipulate routing updates and will have a detailed understanding of path control in routing as well as being able to implement IPv6 routing.

**Learning outcomes**

There are **eight** learning outcomes to this unit. The learner will:

1. Understand the principles of routing services
2. Be able to implement an EIGRP-based solution
3. Be able to implement an OSPF-based solution
4. Understand the manipulation of routing updates
5. Understand path control
6. Be able to implement a BGP solution for ISP connectivity
7. Be able to implement Routing Facilities for branch offices and mobile workers
8. Be able to implement IPv6 in an enterprise network

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related course Cisco test

# Unit 4520-432 Cisco CCNP route

## Assessment Criteria

### **Outcome 1 Understand the principles of routing services**

The learner can:

1. Describe common enterprise traffic requirements and network design models
2. Review the fundamentals of routing and compare various routing protocols
3. Describe how to create an implementation plan for implementing routing services in an enterprise network

### **Outcome 2 Be able to implement an EIGRP-based solution**

The learner can:

1. Describe the basic functions and operation of EIGRP
2. Plan and implement EIGRP routing
3. Configure and verify basic EIGRP in an enterprise WAN

### **Outcome 3 Be able to implement an OSPF-based solution**

The learner can:

1. Describe OSPF Terminology and operation within various enterprise environments
2. Plan and configure OSPF routing
3. Describe and configure OSPF in various WAN network types
4. Configure and verify advanced OSPF features Configure and verify OSPF authentication
5. Describe and configure various OSPF area types

### **Outcome 4 Understand the manipulation of routing updates**

The learner can:

1. Describe network performance issues and ways to control routing updates and traffic
2. Describe, configure and verify various methods for controlling routing update traffic
3. Describe the purpose of and considerations for using multiple protocols in a network
4. Configure and verify route redistribution of multiple protocols

### **Outcome 5 Understand path control**

The learner can:

1. Describe how the various path control methods affect traffic
2. Configure offset-lists for path control.
3. Configure the IP Service-Level Agreement feature for path control
4. Configure policy-based routing (PBR) for path control

### **Outcome 6 Be able to implement a BGP solution for ISP connectivity**

The learner can:

1. Describe the requirements for connecting an enterprise network to an ISP
2. Describe basic BGP terminology and operation, including EBGP and IBGP
3. Configure and verify basic BGP
4. Describe and configure various methods for manipulating path selection

## **Outcome 7 Be able to implement Routing Facilities for branch offices and mobile workers**

The learner can:

1. Describe the fundamentals of branch office connectivity
2. Describe the various services that can be implemented for branch office connectivity
3. Describe the necessary configurations for a branch office to connect to an enterprise network
4. Describe the fundamentals of mobile worker connectivity
5. Describe the necessary configurations for a mobile worker to connect to an enterprise network

## **Outcome 8 Be able to implement IPv6 in an enterprise network**

The learner can:

1. Describe the basics of IPv6 addressing
2. Describe and configure IPv6 addresses
3. Describe and configure IPv6 routing
4. Describe and configure IPv6 tunneling
5. Describe and configure static and dynamic NAT-PT

**Level:** 4  
**Credit value:** 10  
**UAN:** J/601/9582

**Unit aim**

The aim of this unit is to teach the learner the knowledge required in order for them to sit the Cisco CCNP Switch exam. To be able to do this the learner will learn to analyse Enterprise Campus Architecture and be able to implement VLANs and Spanning Tree protocols. They will also learn to understand high availability and infrastructure security in campus infrastructure as well as learning about advanced service such as voice and video.

**Learning outcomes**

There are **seven** learning outcomes to this unit. The learner will:

1. Understand the analysis of an enterprise campus architecture
2. Be able to implement VLANs in campus networks
3. Be able to implement spanning tree
4. Be able to implement inter-VLAN routing
5. Understand high availability and redundancy in a campus network
6. Understand campus infrastructure security
7. Understand the preparation of the campus infrastructure for advanced services

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related course Cisco test

# Unit 4520-433 Cisco CCNP switch

## Assessment Criteria

### **Outcome 1 Understand the analysis of an enterprise campus architecture**

The learner can:

1. Describe common campus design options and how design choices affect implementation and support of a campus LAN
2. Describe common campus design options and how design choices affect implementation and support of a campus LAN

### **Outcome 2 Be able to implement VLANs in campus networks**

The learner can:

1. Plan VLAN technologies, trunks and addressing schemes to meet business and technical requirements and constraints
2. Configure VLANs and VLAN trunks in the campus network to support business and technical requirements
3. Configure and verify an EtherChannel in a Layer 2 topology

### **Outcome 3 Be able to implement spanning tree**

The learner can:

1. Describe spanning tree protocols
2. Configure and verify spanning tree protocols in a layer 2 topology
3. Configure STP features to enhance resiliency and prevent forwarding loops
4. Troubleshoot spanning tree issues

### **Outcome 4 Be able to implement inter-VLAN routing**

The learner can:

1. Explain methods of inter-VLAN routing
2. Configure and verify inter-VLAN routing in a Layer 2 topology using multilayer switching
3. Explain DHCP operation and configure DHCP.. Configure and verify inter-VLAN routing in a Layer 2 topology using CEF-based multilayer switching

### **Outcome 5 Understand high availability and redundancy in a campus network**

The learner can:

1. Implement and monitor high availability
2. Describe switch supervisor redundancy
3. Describe gateway redundancy protocols
4. Configure and verify gateway redundancy protocols. Configure and verify Cisco IOS server load balancing

### **Outcome 6 Understand campus infrastructure security**

The learner can:

1. Evaluate attacks and threats to switches and methods to mitigate attacks
2. Configure tight control of trunk links to mitigate VLAN hopping attacks
3. Configure switches to guard against MAC-based attacks and secure layer 2 devices
4. Configure switches to guard against DHCP, MAC, and address resolution protocol
5. Describe tools used to monitor and analyze network traffic

## **Outcome 7    Understand the preparation of the campus infrastructure for advanced services**

The learner can:

1. Evaluate the impact of WLANs, voice, and video on campus infrastructure operations
2. Describe quality of service in a campus infrastructure to support advanced services
3. Implement multicast in a campus infrastructure to support advanced services
4. Prepare campus networks for the integration of wireless LANs into campus networks
5. Prepare campus networks for the integration of voice into campus networks
6. Prepare campus networks for the integration of video

**Level:** 4  
**Credit value:** 20  
**UAN:** L/601/9583

**Unit aim**

The aim of this unit is to teach the learner the knowledge required in order for them to sit the Cisco CCNP Troubleshooting exam. To be able to do this the learner will learn how to plan for and troubleshoot maintenance in complex networks. They will learn to implement various tools and applications to aid troubleshooting as well as learning to troubleshoot in networks and in security implementations.

**Learning outcomes**

There are **nine** learning outcomes to this unit. The learner will:

1. Be able to plan maintenance for complex networks
2. Understand troubleshooting processes for complex enterprise networks
3. Be able to implement maintenance and troubleshooting tools and applications
4. Be able to maintain and troubleshoot campus switched solutions
5. Be able to maintain and troubleshoot routing solutions
6. Be able to maintain and troubleshoot addressing services
7. Be able to maintain and troubleshoot network performance issues on converged
8. Be able to maintain and troubleshoot network security implementations
9. Be able to maintain and troubleshoot integrated, complex enterprise networks

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **180** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Must be examined by the related course Cisco test.

# Unit 4520-434 Cisco CCNP troubleshooting

## Assessment Criteria

### **Outcome 1 Be able to plan maintenance for complex networks**

The learner can:

1. Evaluate commonly-practiced models and methodologies for network maintenance
2. Describe maintenance methodologies
3. Describe essential maintenance tasks
4. Describe network maintenance and troubleshooting tools

### **Outcome 2 Understand troubleshooting processes for complex enterprise networks**

The learner can:

1. Describe troubleshooting methodologies
2. Describe essential troubleshooting tasks
3. Describe network maintenance and troubleshooting tools
4. Plan and implement troubleshooting procedures as part of a structured troubleshooting methodology

### **Outcome 3 Be able to implement maintenance and troubleshooting tools and applications**

The learner can:

1. Describe network maintenance and troubleshooting tools
2. Implement network monitoring

### **Outcome 4 Be able to maintain and troubleshoot campus switched solutions**

The learner can:

5. Troubleshoot switch-to-switch connectivity
6. Troubleshoot Layer 2 forwarding problems
7. Troubleshoot spanning-tree configurations
8. Troubleshoot Layer 3 forwarding problems
9. Diagnose VLAN, VTP and trunking problems using the IOS command line interface

### **Outcome 5 Be able to maintain and troubleshoot routing solutions**

The learner can:

6. Diagnose network layer connectivity problems using the IOS command line interface
7. Troubleshoot Layer 3 forwarding problems
8. Troubleshoot EIGRP problems
9. Troubleshoot OSPF problems
10. Troubleshoot route redistribution problems
11. Troubleshoot BGP problems

### **Outcome 6 Be able to maintain and troubleshoot addressing services**

The learner can:

3. Troubleshoot a DHCP client and server solution
4. Troubleshoot NAT/PAT configurations

## **Outcome 7 Be able to maintain and troubleshoot network performance issues on converged**

The learner can:

3. Troubleshoot Layer 2 forwarding problems
4. Troubleshoot network implementations for wireless, VoIP and video solutions

## **Outcome 8 Be able to maintain and troubleshoot network security implementations**

The learner can:

7. Describe security features commonly implemented in complex networks and how those features affect the troubleshooting process
8. Troubleshoot AAA implementation
9. Troubleshoot ACLs and firewall implementations
10. Troubleshoot switch security implementation
11. Troubleshoot security issues related to IOS services and device hardening
12. Troubleshoot private VLANs
13. Describe issues related to branch office and remote worker implementations

## **Outcome 9 Be able to maintain and troubleshoot integrated, complex enterprise networks**

The learner can:

9. Diagnose and resolve problems in integrated, complex enterprise networks

**Level:** 4  
**Credit value:** 20  
**UAN:** M/502/8993

**Unit aim**

The aim of this unit is to teach the learner the knowledge required in order for them to sit the CIW E-commerce designer exam. To be able to do this the learner will learn to host a functional e-commerce site, manage an online database and support supplier transactions through the site and learn to understand any legal and ethical marketing techniques needed for their website.

**Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

10. Be able to host a functional e-commerce site
11. Be able to support supplier transactions
12. Understand legal and ethical marketing

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **140** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using approved CIW examinations

# Unit 4520-435 CIW E-commerce designer

## Assessment Criteria

### **Outcome 1 Be able to host a functional e-commerce site**

The learner can:

1. Analyse site requirements
2. Implement a functional e-commerce site
3. Implement web based e-learning resources
4. Manage an online database
5. Install and manage online payment service
6. Administer a knowledge base

### **Outcome 2 Be able to support supplier transactions**

The learner can:

1. Manage Internet transactions
2. Manage web server technology
3. Evaluate and optimise site performance
4. Implement and support secure transactions
5. Manage site security and data privacy

### **Outcome 3 Understand legal and ethical marketing**

The learner can:

1. Evaluate and implement brand awareness resources
2. Review legal and intellectual property issues
3. Plan and implement e-commerce marketing
4. Manage customer services

**Level:** 4  
**Credit value:** 40  
**UAN:** F/502/8996

**Unit aim**

The aim of this unit is to teach the learner the knowledge required in order for them to sit the CIW Certified Internet Web Professional exam. To be able to do this the learner will learn to host a functional e-commerce site, manage an online database and support supplier transactions through the site. The learner will be able to understand any legal and ethical marketing techniques for their website. They learners will also learn to manage elements of a website and evaluate the design choices of the site, also enhancing the site structure and implementing any design changes.

**Learning outcomes**

There are **seven** learning outcomes to this unit. The learner will:

1. Be able to host a functional e-commerce site
2. Be able to support supplier transactions
3. Understand legal and ethical marketing
4. Be able to manage the elements of a web site4.1
5. Be able to evaluate a web site
6. Be able to enhance a web site structure
7. Be able to manage client/server side technologies

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **250** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using approved CIW examinations.

# Unit 4520-436      CIW Certified Internet Web Professional

## Assessment Criteria

### **Outcome 1    Be able to host a functional e-commerce site**

The learner can:

1. Analyse site requirements
2. Select and implement a functional e-commerce site
3. Implement web based e-learning resources
4. Manage an online database
5. Install and manage online payment service
6. Administer a knowledge base

### **Outcome 2    Be able to support supplier transactions**

The learner can:

1. Manage Internet transactions
2. Manage web server technology
3. Evaluate and optimise site performance
4. Implement and support secure transactions
5. Manage site security and data privacy

### **Outcome 3    Understand legal and ethical marketing**

The learner can:

1. Evaluate and implement brand awareness resources
2. Review legal and intellectual property issues
3. Plan and implement e-commerce marketing
4. Manage customer services

### **Outcome 4    Be able to manage the elements of a web site4.1**

The learner can:

1. Manage the website design process
2. Manage the website production process
3. Maintain the ethics of a website

### **Outcome 5    Be able to evaluate a web site**

The learner can:

1. Implement site design and layout techniques
2. Critically review site design and usability

### **Outcome 6    Be able to enhance a web site structure**

The learner can:

1. Implement X/HTML in accordance with current standards
2. Enhance a website with X/HTML
3. Implement a range of images in a web site
4. Implement site GUI elements
5. Manage the server implementation of the web site

## **Outcome 7 Be able to manage client/server side technologies**

The learner can:

1. Implement rich media technologies on a web site
2. Manage client and server side scripting
3. Manage database integration
4. Manage search engine optimisation
5. Manage RSS feeds and syndication
- 6.

**Level:** 4  
**Credit value:** 20  
**UAN:** L/502/8998

**Unit aim**

The aim of this unit is to teach the learner the knowledge required in order for them to sit the CIW Web Design Specialist exam. To be able to do this the learner will learn to manage the elements of website design whilst maintaining ethics within the design. The learner will learn to evaluate a website and enhance its structure by using X/HTML. They will also learn to manage client and server side technologies.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to manage the elements of a web site
2. Be able to evaluate a web site
3. Be able to enhance a web site structure
4. Be able to manage client/server side technologies

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **140** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

To be assessed using approved CIW examinations.

# Unit 4520-437      CIW Web Design Specialist

## Assessment Criteria

### **Outcome 1    Be able to manage the elements of a web site**

The learner can:

1. Manage the website design process
2. Manage the website production process
3. Maintain the ethics of a website

### **Outcome 2    Be able to evaluate a web site**

The learner can:

1. Implement site design and layout techniques
2. Critically review site design and usability

### **Outcome 3    Be able to enhance a web site structure**

The learner can:

1. Implement X/HTML in accordance with current standards
2. Enhance a website with X/HTML
3. Implement a range of images in a web site
4. Implement site GUI elements
5. Manage the server implementation of the web site

### **Outcome 4    Be able to manage client/server side technologies**

The learner can:

1. Implement rich media technologies on a web site
2. Manage client and server side scripting
3. Manage database integration
4. Manage search engine optimisation
5. Manage RSS feeds and syndication

**Level:** 4  
**Credit value:** 15  
**UAN:** L/601/1984

**Unit aim**

The purpose of this unit is to provide learners with the principles of software application testing. Learners will develop their skills to test, implement and evaluate software applications prior to commercial deployment regardless of the software language being used.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand the principles of software application testing
2. Be able to design test strategies
3. Be able to implement test plans
4. Be able to evaluate test plans

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

# Unit 4520-438      Software Applications Testing

## Assessment Criteria

### **Outcome 1      Understand the principles of software application testing**

The learner can:

1. Evaluate testing techniques applicable to the testing opportunity
2. Compare the relative benefits of different testing methodologies
3. Justify a proposed testing methodology

### **Outcome 2      Be able to design test strategies**

The learner can:

1. Design a test strategy for a given testing opportunity
2. Design a test plan for a given testing opportunity
3. Justify the test plan proposition and testing strategy

### **Outcome 3      Be able to implement test plans**

The learner can:

1. **Implement a test plan** based on a given testing opportunity.

#### **Range**

##### **Implement a test plan**

Test plan

Test data

Test log

Reporting of malfunctions

Developers not to test own work

### **Outcome 4      Be able to evaluate test plans**

The learner can:

1. Critically **review the test outcomes**
2. **Justify the validity of the test** and identify any potential issues

#### **Range**

##### **Review the test outcomes**

Testing report

Critical review of any failures

Analyse all test results

Comparison to design specification

End user/tester feedback

Peer reviews

##### **Justify the validity of the test**

Test results

Compare test used with alternatives

Maximised test coverage

Technical documentation

Recording changes resulting from testing

## Unit 4520-439

## Provide leadership and direction for own area of responsibility

**Level:** 4  
**Credit value:** 5  
**UAN:** T/600/9601

### Unit aim

This unit helps learners to provide leadership and direction for their area of responsibility.

### Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to lead in own area of responsibility
2. Be able to provide direction and set objectives in own area of responsibility
3. Be able to communicate the direction for own area of responsibility and collect feedback to inform improvement
4. Be able to assess own leadership performance

### Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

### Endorsement of the unit by a sector or other appropriate body

This unit has been developed by the Management Standards Centre.. This unit is endorsed by e-skills UK.

### How is this unit assessed?

This unit will be assessed by a portfolio of evidence.

## **Unit 4520-439      Provide leadership and direction for own area of responsibility**

### Assessment Criteria

#### **Outcome 1    Be able to lead in own area of responsibility**

The learner can:

1. Identify own strengths and ability to lead in a leadership role
2. Evaluate strengths within own area of responsibility.

#### **Outcome 2    Be able to provide direction and set objectives in own area of responsibility**

The learner can:

1. Outline direction for own area of responsibility
2. Implement objectives with colleagues that align with those of the organisation.

#### **Outcome 3    Be able to communicate the direction for own area of responsibility and collect feedback to inform improvement**

The learner can:

1. Communicate the agreed direction to individuals within own area of responsibility
2. Collect feedback to inform improvement.

#### **Outcome 4    Be able to assess own leadership performance**

The learner can:

1. Assess feedback on own leadership performance
2. Evaluate own leadership performance.

**Level:** 4  
**Credit value:** 5  
**UAN:** H/600/9674

**Unit aim**

This unit helps learners to plan, allocate and monitor work in own area of responsibility, and make any necessary changes to original work plans.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Be able to produce a work plan for own area of responsibility
2. Be able to allocate and agree responsibilities with team members
3. Be able to monitor the progress and quality of work in own area of responsibility and provide feedback
4. Be able to review and amend plans of work for own area of responsibility and communicate changes

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **25** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by Portfolio of evidence.

## **Unit 4520-440      Plan, allocate and monitor work in own area of responsibility**

### Assessment Criteria

#### **Outcome 1    Be able to produce a work plan for own area of responsibility**

The learner can:

1. Explain the context in which work is to be undertaken
2. Identify the skills base and the resources available
3. Examine priorities and success criteria needed for the team
4. Produce a work plan for own area of responsibility.

#### **Outcome 2    Be able to allocate and agree responsibilities with team members**

The learner can:

1. Identify team members' responsibilities for identified work activities
2. Agree responsibilities and SMART (Specific, Measurable, Achievable, Realistic and Time-bound) objectives with team members.

#### **Outcome 3    Be able to monitor the progress and quality of work in own area of responsibility and provide feedback**

The learner can:

1. Identify ways to monitor progress and quality of work
2. Monitor and evaluate progress against agreed standards and provide feedback to team members.

#### **Outcome 4    Be able to review and amend plans of work for own area of responsibility and communicate changes**

The learner can:

1. Review and amend work plan where changes are needed
2. Communicate changes to team members.

**Level:** 4  
**Credit value:** 8  
**UAN:** J/600/9750

**Unit aim**

This unit covers the skills and knowledge required to allow learners to manage projects they have been given responsibility for. This involves developing and agreeing a plan for the project and monitoring and controlling implementation of and changes to the plan. It also involves ensuring that the project achieves its key objectives and is completed to the satisfaction of the project sponsor(s) and any key stakeholders.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Understand the principles, processes, tools and techniques of project management
2. Be able to agree the scope and objectives of a project
3. Be able to identify the budget in order to develop a project plan
4. Be able to implement a project plan
5. Be able to manage a project to its conclusion.

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit has been developed by the Management Standards Centre. This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by a portfolio of evidence.

# Unit 4520-441 Plan and Manage a Project

## Assessment Criteria

### **Outcome 1 Understand the principles, processes, tools and techniques of project management**

The learner can:

1. Describe the roles and responsibilities of a project manager
2. Explain how to apply principles, processes, tools and techniques of project management.

### **Outcome 2 Be able to agree the scope and objectives of a project**

The learner can:

1. Agree SMART (Specific, Measurable, Achievable, Realistic, and Time-bound) objectives and scope of the project with project sponsor(s) and stakeholders.

### **Outcome 3 identify the budget in order to develop a project plan**

The learner can:

1. Identify budget and time-scales in order to develop the project plan with stakeholders
2. Consult with stakeholders to negotiate the project plan
3. Identify potential risks and contingencies
4. Establish criteria and processes for evaluating the project on completion.

### **Outcome 4 Be able to manage a project to its conclusion.**

The learner can:

1. Allocate roles and responsibilities to project team members
2. Provide resources identified in the project plan
3. Brief project team members on the project plan and their roles and responsibilities
4. Implement a project plan using project management tools and techniques.

### **Outcome 5 Be able to manage a project to its conclusion.**

The learner can:

1. Apply a range of project management tools and techniques to monitor, control and review progress
2. Provide support to project team members.

**Level:** 4  
**Credit value:** 4  
**UAN:** Y/600/9798

**Unit aim**

This unit allows learners to prepare for, and participate in, quality audits within their area of responsibility as part of a formal quality management system.

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Understand the quality standards and procedures that apply to own area of responsibility
2. Be able to monitor work in own area of responsibility against quality standards and procedures
3. Be able to prepare for a quality audit in own area of responsibility
4. Be able to discuss quality audit findings with the auditor
5. Be able to complete agreed actions following a quality audit.

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit has been developed by the Management Standards Centre. This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

# **Unit 4520-442      Prepare for and Support Quality Audits**

## Assessment Criteria

### **Outcome 1      Understand the quality standards and procedures that apply to own area of responsibility**

The learner can:

1. Describe the quality standards and procedures that apply to own area of responsibility.

### **Outcome 2      Be able to monitor work in own area of responsibility against quality standards and procedures**

The learner can:

1. Select and apply methods for monitoring work.

### **Outcome 3      Be able to prepare for a quality audit in own area of responsibility**

The learner can:

1. Prepare and organise records and documentation for the quality auditor
2. Review previous quality audits and ensure agreed recommendations have been implemented.

### **Outcome 4      Be able to complete agreed actions following a quality audit.**

The learner can:

1. Discuss with the auditor the results of the audit and identify any areas for improvement
2. Agree corrective actions to remedy any identified issues, and set a date for their implementation.

### **Outcome 5      Be able to complete agreed actions following a quality audit.**

The learner can:

1. Take corrective action based on quality audit findings.

**Level:** 4  
**Credit value:** 7  
**UAN:** R/506/1999

**Unit aim**

This unit aims to develop the knowledge and skills required to manage a project. Upon completion of this unit, learners will have developed an understanding of the management of a project and will be able to plan, manage and evaluate a project.

**Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand the management of a project
2. Be able to plan a project
3. Be able to manage a project
4. Be able to evaluate the effectiveness of a project

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **38** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

# Unit 4520-443      Manage a project

## Assessment Criteria

### **Outcome 1      Understand the management of a project**

The learner can:

1. Explain how to carry out a cost-benefit analysis for a project
2. Evaluate the use of risk analysis techniques
3. Evaluate project planning and management tools and techniques
4. Evaluate the impact of changes to project scope, schedule, finance, risk, quality and resources
5. Analyse the requirements of project governance arrangements.

### **Outcome 2      Be able to plan a project**

The learner can:

1. Analyse how a project fits with an organisation's overall vision, objectives, plans and programmes of work
2. Agree the objectives and scope of proposed projects with stakeholders
3. Assess the interdependencies and potential risks within a project
4. Develop a project plan with specific, measurable, achievable, realistic and time-bound (SMART) objectives, key performance indicators (KPIs) and evaluations mechanisms appropriate to the plan
5. Develop proportionate and targeted plans to manage identified risks and contingencies
6. Apply project lifecycle approaches to the progress of a project.

### **Outcome 3      Be able to manage a project**

The learner can:

1. Allocate resources in accordance with the project plan
2. Brief project team members on their roles and responsibilities
3. Implement plans within agreed budgets and timescales
4. Communicate the requirements of the plans to those who will be affected
5. Revise plans in the light of changing circumstances in accordance with project objectives and identified risks
6. Keep stakeholders up to date with developments and problems
7. Complete close-out actions in accordance with project plans
8. Adhere to organisational policies and procedures, legal and ethical requirements when managing a project.

### **Outcome 4      Be able to evaluate the effectiveness of a project**

The learner can:

2. Conduct periodic reviews of the progress and effectiveness of a project using information from a range of sources
3. Evaluate the effectiveness of capturing and managing project-related knowledge
4. Report on the effectiveness of plans.

**Level:** 4  
**Credit value:** 12  
**UAN:** A/505/5792

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to prepare for Information Security Risk Assessments
2. Be able to carry out Information Security Risk Assessments

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **40** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

# **Unit 4520-444      Carrying out Information Security Risk Assessment**

## Assessment Criteria

### **Outcome 1    Be able to prepare for Information Security Risk Assessments**

The learner can:

1. Interpret given risk assessment briefs to identify the information assets and system components to be assessed
2. Verify the scope of identified information assets and system components with relevant persons
3. Evaluate sources of information relating to potential risks that may impact on the security of identified information assets and system components.

### **Outcome 2    Be able to carry out Information Security Risk Assessments**

The learner can:

1. Use a range of investigative methods to gather information relating to potential risks that may impact on the security of identified information assets and system components
2. Record all gathered information in line with organisational requirements
3. Analyse gathered information to identify risks to the security of identified information assets and system components
4. Assess identified risks to determine their probability of occurrence and potential impact
5. Evaluate risks against organisational risk tolerance levels
6. Report any risks which exceed organisational risk tolerance levels to the relevant persons following organisational procedures and timelines
7. Formulate actions to mitigate risks
8. Report the results of Risk Assessment in line with organisational procedures
9. Communicate the results and implications of risk assessments to relevant persons using media, format and structures which meet the needs of the intended audience
10. Evaluate organisational procedures for Risk Assessment.

**Level:** 3  
**Credit value:** 9  
**UAN:** F/505/5793

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to gather information to investigate Information Security Incidents
2. Be able to investigate Information Security incidents.

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **23** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

# **Unit 4520-445      Investigating Information Security incidents**

## Assessment Criteria

### **Outcome 1      Be able to gather information to investigate Information Security Incidents**

The learner can:

1. Manage the website design process
2. Manage the website production process
3. Maintain the ethics of a website.

### **Outcome 2      Be able to investigate Information Security incidents.**

The learner can:

1. Implement site design and layout techniques
2. Critically review site design and usability.

**Level:** 4  
**Credit value:** 12  
**UAN:** L/505/5814

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to develop Information Security risk contingency plans
2. Be able to manage information security risks.

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **40** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

# **Unit 4520-446      Carrying out Information Security Risk Management**

## Assessment Criteria

### **Outcome 1      Be able to develop Information Security risk contingency plans**

The learner can:

1. Interpret given risk management briefs to identify the information assets and system components to be covered by the risk contingency plan
2. Verify the scope of identified information assets and system components with relevant persons
3. Develop risk contingency plans on a given analysis of the probability and impact of all identified risks
4. Justify the range of response actions that may be used to mitigate risks
5. Evaluate risk contingency plans against external standards and legislation
6. Record Information Security risk contingency plans in line with organisational requirements.

### **Outcome 2      Be able to manage information security risks.**

The learner can:

1. Manage defined response actions to risks which impact the integrity of information assets and system components following organisational procedures and timelines
2. Report any risks arising for which no response actions have been defined to the relevant persons following organisational procedures and timelines
3. Report on information security risk management activities following organisational procedures
4. Communicate the results and implications of risk management activities to relevant persons using media, format and structures which meet the needs of the intended audience
5. Evaluate organisational procedures for Risk Management.

**Level:** 4  
**Credit value:** 12  
**UAN:** A/505/5811

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to prepare for information security audit activities
2. Be able to carry out information security audit activities

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **30** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

# Unit 4520-447 Carrying out Information Security audits

## Assessment Criteria

### **Outcome 1 Be able to prepare for information security audit activities**

The learner can:

1. Interpret given information security audit briefs to identify the information assets and system components to be audited
2. Identify sources of information relating to the information assets and system components in scope
3. Develop audit plans, following organisational procedures, which will ensure a thorough assessment of security compliance across the whole scope of the audit
4. Verify audit scope and plans with relevant persons.

### **Outcome 2 Be able to carry out information security audit activities**

The learner can:

1. Carry out information security audits following organisational procedures
2. Critically review information and data relating to information assets and system components to assess security compliance
3. Report any security non-compliance to the relevant persons in line with organisational procedures and timelines
4. Report on audit activities following organisational procedures
5. Make justified recommendations for actions to be taken to improve security compliance to relevant persons using media, format and structures which meet the needs of the intended audience.

**Level:** 4  
**Credit value:** 9  
**UAN:** M/505/5806

**Learning outcomes**

There are **one** learning outcomes to this unit. The learner will:

1. Be able to carry out Information Security forensic examinations.

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

**Outcome 1 Be able to carry out Information Security forensic examinations.**

The learner can:

1. Carry out forensic examinations following organisational procedures
2. Analyse system information for evidence of actual or attempted breaches of security policy or legislation
3. Report any identified actual or attempted breaches of security to the relevant persons following organisational procedures and timelines
4. Use security tools to analyse the integrity of software
5. Take actions to secure information assets and system components subject to actual or attempted breaches of security in line with organisational timelines
6. With the authorisation of relevant persons, seize evidence in accordance with legislation and following organisational procedures
7. Seize evidence, minimising disruption to the organisation and maintaining evidential integrity.

**Level:** 4  
**Credit value:** 15  
**UAN:** A/505/5789

**Learning outcomes**

There are **two** learning outcomes to this unit. The learner will:

1. Be able to plan security testing
2. Be able to carry out security testing

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

**Outcome 1 Be able to plan security testing**

The learner can:

1. Develop a context driven test approach to systematically test specified parts of a system in order to assess their information security status
2. Analyse given information assurance requirements to produce information security test acceptance criteria
3. Develop test scripts and plans to ensure that all information assurance requirements are tested
4. Prioritise testing activity to target the most significant threats and vulnerabilities first
5. Select, and where necessary adapt, methods, tools and techniques to conduct penetration testing
6. Define all required test preparation and conclusion activities.

**Outcome 2 Be able to carry out security testing**

The learner can:

1. Ensure that all required preparations are implemented, in line with test plans, prior to carrying out tests
2. Apply test methods, tools and techniques following organisational procedures
3. Record the results of tests using organisational documentation
4. Ensure that all required activities have been correctly implemented following the completion of testing in line with test plans
5. Critically evaluate the results of testing to accurately identify specific vulnerabilities
6. Prioritise identified vulnerabilities against information assurance requirements
7. Determine and justify actions to mitigate identified vulnerabilities
8. Report the results of test activities following organisational procedures
9. Communicate the results and implications of test activities to relevant persons using media, format and structures which meet the needs of the intended audience
10. Evaluate organisational procedures for carrying out security testing.

**Level:** 4  
**Credit value:** 15  
**UAN:** R/601/0447

**Unit aim****Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand databases and data management systems
2. Understand database design techniques
3. Be able to design, create and document databases

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

# Unit 4520-450 Database design concepts

## Assessment Criteria

### **Outcome 1 Understand databases and data management systems**

The learner can:

1. Analyse the key issues and application of databases within organisational environments
2. Critically evaluate the features and advantages of database management systems.

### **Outcome 2 Understand database design techniques**

The learner can:

1. Analyse a database developmental methodology
2. Discuss entity-relationship modelling and normalisation.

### **Outcome 3 Be able to manage a project**

The learner can:

1. Apply the database developmental cycle to a given data set
2. Design a fully functional database (containing at least four inter-relational tables) including user interface
3. Evaluate the effectiveness of the database solution and suggest methods of improvement
4. Provide supporting user and technical documentation.

**Level:** 4  
**Credit value:** 15  
**UAN:** K/504/5503

**Unit aim****Learning outcomes**

There are **four** learning outcomes to this unit. The learner will:

1. Understand the principles of IT & Telecoms testing
2. Plan for the testing of an IT or Telecoms system
3. Control the testing of system components
4. Evaluate test results.

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

# Unit 4520-451      Testing IT & Telecoms Systems

## Assessment Criteria

### **Outcome 1      Understand the principles of IT & Telecoms testing**

The learner can:

1. Explain the purposes of testing
2. Explain the factors which determine the applicability of different classes of test
3. Explain the importance of preparation and conclusion activities associated with testing and the circumstances in which they may be required
4. Explain organisational requirements and procedures for testing
5. Explain organisational requirements and procedures for testing.

### **Outcome 2      Plan for the testing of an IT or Telecoms system**

The learner can:

1. Analyse available information to correctly define the system functionality to be tested and the purpose of the test
2. Select and document the types, sequences and numbers of tests required to thoroughly test the defined system functionality
3. Select, and where necessary adapt, test equipment or software to be used
4. Accurately determine the types and amounts of inputs and expected outputs for the planned tests
5. Define all required test preparation and conclusion activities

### **Outcome 3      Control the testing of system components**

The learner can:

1. Ensure that all required preparations are correctly implemented prior to carrying out tests
2. Instruct others in the effective use of test equipment or software
3. Ensure that all required activities have been correctly implemented following the completion of testing
4. Develop the documentation to be used for recording test results
5. Contribute to the development of organisational test strategy.

### **Outcome 4      Evaluate test results**

The learner can:

1. Ensure that records of individual tests are correctly analysed to identify discrepancies between actual and expected outputs and the source of any recorded errors
2. Investigate and document the probable causes of identified discrepancies and errors
3. Examine multiple test records to identify trends or recurring discrepancies and errors.

**Level:** 4  
**Credit value:** 15  
**UAN:** J/601/3300

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Design event-driven programs to address loosely-defined problems
2. Produce a working event-driven program which meets the design specification
3. Develop event-driven programs that reflect established programming and software engineering practice
4. Develop test strategies and apply these to event-driven programs
5. Develop design documentation for use in program maintenance and end-user documentation

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

**Assessment Criteria****Outcome 1 Design event-driven programs to address loosely-defined problems**

The learner can:

1. Identify and structure the components and data required to address problems
2. Select and use pre-defined components, specialising as required
3. Identify the set of events that invoke behaviour of components and other programme elements
4. Specify the behaviour of components and other program elements to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
5. Record the design using well-established notations

**Outcome 2 Produce a working event-driven program which meets the design specification**

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

**Outcome 3 Develop event-driven programs that reflect established programming and software engineering practice**

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

**Outcome 4 Develop test strategies and apply these to event-driven programs**

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program

**Outcome 5 Develop design documentation for use in program maintenance and end-user documentation**

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

## Unit 4520-453

# Designing and developing object-oriented computer programs

**Level:** 4  
**Credit value:** 15  
**UAN:** T/601/3308

### Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Design object-oriented programs to address loosely-defined problems
2. Produce a working object-oriented program which meets the design specification
3. Develop object-oriented programs that reflect established programming and software engineering practice
4. Develop test strategies and apply these to object-oriented programs
5. Develop design documentation for use in program maintenance and end-user documentation

### Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

### Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

### How is this unit assessed?

This unit is assessed by portfolio of evidence.

# **Unit 4520-453      Designing and developing object-oriented computer programs**

## Assessment Criteria

### **Outcome 1      Design object-oriented programs to address loosely-defined problems**

The learner can:

1. Identify a set of classes and their interrelationships to address the problem
2. Make effective use of encapsulation, inheritance and polymorphism
3. Select and reuse pre-existing objects and templates specialising as required
4. Structure the design so that objects communicate efficiently
5. Specify the properties and behaviour of classes to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
6. Record the design using well-established notations

### **Outcome 2      Produce a working object-oriented program which meets the design specification**

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

### **Outcome 3      Develop object-oriented programs that reflect established programming and software engineering practice**

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

### **Outcome 4      Develop test strategies and apply these to object-oriented programs**

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program

### **Outcome 5      Develop design documentation of use in program maintenance and end-user documentation**

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

**Level:** 3  
**Credit value:** 22  
**UAN:** A/501/5888

**Learning outcomes**

There are **five** learning outcomes to this unit. The learner will:

1. Run cables into the 'End User' premises and fit main and extension telephone sockets
2. Run dropwires in the BT overhead network
3. Cross connect circuits in primary and secondary cross connection points
4. Work safely on wooden poles, steps and ladders
5. Carry out manual handling using the kinetic method

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **60** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-501 Customer Apparatus and Line Installation

## Assessment Criteria

### **Outcome 1 Run cables into the 'End User' premises and fit main and extension telephone sockets**

The learner can:

1. Cite the importance for superb customer service
2. Recognize the key elements of the local access network
3. Drill holes to ISIS standard
4. Install External and Internal cabling in a customers premises
5. Wire PST/NTE sockets
6. State the different standard line conditions found in the Network
7. Use the HAWK tester to identify line conditions and faults.

### **Outcome 2 Run dropwires in the BT overhead network**

The learner can:

1. Identify and use the current tools and equipment required to provide, retension, recover and renew dropwire from customers premises to wooden and hollow poles
2. Provide, retension, renew and recover a single span of Dropwire from a hollow pole to a simulated customer premises, which includes a road crossing
3. Apply the quality standards relating to working with Dropwires, Customer Lead-in, Block Terminals and Customer Fixings when carrying out dropwire provision, renewal and recovery
4. State the current types of customers dropwire fixing
5. Provide a customer dropwire fixing using an Eyebolt Expanding 1A
6. Provide a customers lead-in, up to but not including the point of entry into the customers premises
7. Use Slide Rule Fixing Height - 1A, 1B and 1C. Provide, retension and recover a single span of Dropwire from a wooden pole to a simulated customer premises
8. Identify the types of Low Voltage and High Voltage overhead power lines shown in the BT Health and Safety Handbook
9. State the restrictions of using Dropwire near power lines
10. State the minimum separation distances between Dropwires and power lines
11. State the correct equipment for measuring the height of power lines
12. State where Lightning Protection is fitted. Provide, renew and recover a single span of Dropwire from a wooden pole to a simulated customer premises which includes a road crossing
13. Provide and recover a single span of dropwire, from a simulated customers premises to wooden pole A The dropwire span between pole A and the customer crosses over Low Voltage power
14. Carry out the correct wiring and terminating practices for Cable Dropwire at Box Connections 18A/19A, Block Terminals 76/86 Series, Block Terminal 71A, Block Terminals 41/41A, Box Connection 16A, Block Terminal 66B and NTE 5.

### **Outcome 3 Cross connect circuits in primary and secondary cross connection points**

The learner can:

1. State the purpose of Primary and Secondary Cross Connection Points (PCPs and SCPs)
2. List the termination systems used in PCP's and SCP's
3. State the quality standards required when provide jumpers on the following termination systems:
  - P100/PC100
  - SCC No 1
  - SCC No 2
  - BIX MCCA
  - 3M MS2 MCCA
  - Krone MCCA
  - Quante MCCA
4. Cross connect circuits on and between Krone and Quante MCCA.

### **Outcome 4 Work safely on wooden poles, steps and ladders**

The learner can:

1. Select and carry a three section aluminium ladder
2. Undertake a pre-use check on a three section aluminium ladder
3. Safely load, secure and remove a ladder extension 4B or 5A from a BT vehicle using both the ladder removal tool (LRT) and the manual method
4. Erect a three section aluminium ladder against a solid structure and secure them using a variety of ladder stability devices
5. Safely raise and use a drill at the working position on the ladder
6. Undertake a pre-use check on steps folding
7. Use steps folding safely
8. Erect, tie, climb, descend and then lower a three section aluminium ladder against a wooden pole
9. Check, inspect and fit a Safety Belt No11 ready for use
10. Correctly adjust a Safety Belt No11
11. Correctly carry out a general pole test on the pole to be climbed
12. Safely climb, belt onto and turn on a pole of at least 9m length.

### **Outcome 5 Carry out manual handling using the kinetic method**

The learner can:

1. Demonstrate understanding of the principles of
  - Base Movement
  - Legislation
  - Components of the Spine
  - Causes of Back Pain
  - Safer manual handling
  - Method of holding
  - Manual Handling and Risk Assessments
2. Carry out practical demonstrations using techniques recommended by ROSPA
3. Carry out practical exercises to practice skills in a safe environment.

**Level:** 3  
**Credit value:** 15  
**UAN:** H/601/0663

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand the properties, structures and components included in typical fibre telecommunications networks
2. Understand safe working practices when working with optical fibre networks
3. Know the quality standards and documentation requirements when working on the optical fibre network
4. Prepare and install optical fibre components in exchanges and customer premises
5. Build an external fibre network
6. Know how to construct and re-enter a fibre closure

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **80** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

# Unit 4520-502      Fibre Telecommunications Techniques

## Assessment Criteria

### **Outcome 1      Understand the properties, structures and components included in typical fibre telecommunications networks**

The learner can:

1. Identify different types of optical fibre
2. Identify the physical components required to build a fibre infrastructure
3. Explain the different structures used in fibre networks, and when different structures should be used.

### **Outcome 2      Understand safe working practices when working with optical fibre networks**

The learner can:

1. Identify key safety considerations when working with optical fibre
2. Identify any existing risk assessments for working with fibre networks.
3. Explain how to dispose of redundant or damaged optical fibres.

### **Outcome 3      Know the quality standards and documentation requirements when working on the optical fibre network**

The learner can:

1. Explain the quality standards that apply for all installation and maintenance work on the optical fibre network
2. Explain what technical documentation needs to be completed before and after undertaking work on the fibre network.

### **Outcome 4      Prepare and install optical fibre components in exchanges and customer premises**

The learner can:

1. Prepare optical fibre components for use
2. Provide fibres from a customer premises point of entry to the equipment fibre pigtailed for both two-fibre and single-fibre working
3. Test components before commissioning the components.

### **Outcome 5      Build an external fibre network**

The learner can:

1. Prepare cables for splicing
2. Manage cables on single circuit trays
3. Splice fibres cables on single circuit trays.

### **Outcome 6      Know how to construct and re-enter a fibre closure**

The learner can:

1. Explain where various fibre options should be used
2. Construct a fibre closure
3. Re-enter an existing closure.

**Level:** 3  
**Credit value:** 23  
**UAN:** L/601/0656

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Track and locate underground services using a cable locator
2. Safely assemble and dismantle portable propane equipment
3. Construct and maintain joint closures
4. Construct a temporary joint closure
5. Prepare and joint underground copper cables
6. Prepare and terminate copper cables

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **120** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by a learner portfolio.

**Assessment Criteria****Outcome 1 Track and locate underground services using a cable locator**

The learner can:

1. Carry out functional checks on a cable locator
2. Use a cable locator to:
  - locate and track an underground cable terminating on a known point
  - locate and track a cable in a duct between two known points
  - locate a blockage in a duct
  - locate a buried cover
3. Describe the range of underground services (eg electricity, water, gas) and how to identify them.

**Outcome 2 Safely assemble and dismantle portable propane equipment**

The learner can:

1. Explain safety considerations when working with and storing propane equipment
2. Safely connect and disconnect portable equipment to a propane cylinder
3. Check connected equipment for leaks
4. Carry out an emergency repair to a gas hose
5. Safely store and transport propane equipment
6. Explain the procedures to follow in case of an incident.

**Outcome 3 Construct and maintain joint closures**

The learner can:

1. Safely enter an existing joint closure
2. Explain the actions to take if the joint is found to be defective (eg wet or corroded joints)
3. Explain the actions to take if an obsolete closure is found on a cable
4. Explain when a closure can and cannot be used to house internal and external cables
5. Close a joint (eg inline or cap end closures) to the required quality standards.

**Outcome 4 Construct a temporary joint closure**

The learner can:

1. Explain the circumstances in which a temporary joint closure is appropriate
2. Fit a temporary closure to a non-pressurised cable.

**Outcome 5 Prepare and joint underground copper cables**

The learner can:

1. Prepare copper cables for jointing
2. Describe the circuit identification systems for copper cables
3. Select and use the appropriate connectors to construct a joint according to manufacturer's instructions
4. Use a tester to carry out continuity checks on jointed circuits.

## **Outcome 6 Prepare and terminate copper cables**

The learner can:

1. Prepare a copper cable for termination, according to type of connection required
2. Use an appropriate tool to terminate wires on to the terminal block.

**Level:** 3  
**Credit value:** 2  
**UAN:** H/504/2731

**Learning outcomes**

There are **six** learning outcomes to this unit. The learner will:

1. Understand the principles of work at height
2. Understand the requirements of a workplace health and safety risk assessment
3. Understand the factors that influence selection of work at height equipment
4. Know factors that influence the selection of staff and contractors for work at height
5. Understand planning considerations for work at height
6. Understand the supervision and management of work at height

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **16** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

Assessment is by short answers questions which are centre marked.

This assessment is shared with unit 6144-301 and the assessments and marking scheme can be downloaded from here: <http://www.cityandguilds.com/qualifications-and-apprenticeships/utilities/utilities/6144-understanding-planning-supervising-and-managing-working-at-height>

# **Unit 4520-504      Understand planning supervising and managing work at height**

## Assessment Criteria

### **Outcome 1      Understand the principles of work at height**

The learner can:

1. List key standards and regulations relevant to work at height and outline their purpose
2. Explain the client and consultant relationship including the clients perception that the use of consultants mitigates their legal responsibilities towards health and safety
3. Explain the type of information provided by the schedules under the work at height regulations
4. Define what is meant by work at height
5. Explain principles used to control work at height.

### **Outcome 2      Understand the requirements of a workplace health and safety risk assessment**

The learner can:

1. Define the terms hazards, risks and residual risks
2. Identify working practices that could cause risks to self and others when working at height
3. Produce a risk assessment and method statement for work at height and present the findings and control recommendations
4. Evaluate a risk assessment to identify that existing controls are suitable and sufficient revising accordingly.

### **Outcome 3      Understand the factors that influence selection of work at height equipment**

The learner can:

1. Explain how to select and justify the use of appropriate equipment in relation to the hierarchy of controls
2. Explain the advantages and disadvantages of collective controls
3. Explain the advantages and disadvantages of personal controls
4. Explain where to obtain current relevant information instruction and training on different types of equipment
5. Explain the importance of following suppliers and manufacturers instructions when using equipment materials and products.

### **Outcome 4      Know factors that influence the selection of staff and contractors for work at height**

The learner can:

1. Explain criteria for selecting staff for work at height
2. Explain criteria for selecting contractors for work at height.

## **Outcome 5 Understand planning considerations for work at height**

The learner can:

1. Explain the use of different types of documentation required when planning work at height
2. State ways of preventing injuries from falling objects
3. State ways of preventing falls through fragile materials
4. Explain key considerations when assessing site conditions for work at height
5. Describe the importance of inspecting equipment and keeping records
6. Explain the inspection requirements for different types of work equipment
7. Describe how to evaluate site information in order to develop method statements
8. Describe key information contained within a rescue plan for work at height.

## **Outcome 6 Understand the supervision and management of work at height**

The learner can:

1. Explain the importance of site supervision for own employees
2. Explain the importance of site supervision for persons not directly employed but under own control on site
3. State action required when identifying behaviours that deviate from risk assessments and method statements
4. Describe the action to be taken in the event of a dangerous occurrence
5. Describe the action to be taken in the event of a near miss.

**Level:** 3  
**Credit value:** 2  
**UAN:** H/601/7399

**Unit aim**

The aim of this unit is to assess learners in acting as top man / person in a high risk confined space environment. It involves overseeing a work team preparing to work safely and entering and exiting the confined space safely. The unit also assesses learners monitoring procedures and deal with emergencies. There is also a behavioural emphasis on the candidate undertaking the assessment in an efficient and safe manner. The unit also requires the learner to demonstrate sufficient knowledge of working as a top man in a high risk environment through a mix of practical observation and written assessment

**Learning outcomes**

There are **seven** learning outcomes to this unit. The learner will:

1. Prepare to act as top man for high risk teams working in confined spaces
2. Oversee safe entry and exit to high risk confined spaces
3. Monitor work of teams to ensure procedures are followed
4. Prepare for and deal with emergencies
5. Use appropriate behaviour for carrying out top man work in high risk confined spaces
6. Use appropriate knowledge for carrying out top person work in high risk confined spaces
7. Apply relevant industry standards for top person work in high risk confined spaces

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **20** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by Energy and Utility Skills.

**How is this unit assessed?**

- Direct observation of the learner overseeing work in a high risk confined space
- Short answer questions which are externally set and centre marked.

These are shared with 6150, and contained within the 6150-54 assessment pack saved here:

**<http://www.cityandguilds.com/qualifications-and-apprenticeships/utilities/utilities/6150-confined-spaces#tab=information&acc=level3>**

**Notes for guidance**

This top man role for high risk also extends to interpretation, planning, supervision, coordination and accountability for the team and the work being undertaken in the confined space during both planned work and emergency situations.

In this regard, the role is autonomous and pitched at a higher level than is generally seen of a traditional 'top-man'. This is further emphasised when it is taken into account that in this role the learner will also be responsible for committing a work team in potentially non-routine environments,

which is a significant departure in terms of responsibility, skills and competence of the traditional 'top- man'.

Important: completion of this unit does not make the learner competent to enter / work in a confined space.

# Unit 4520-505 Top Person for High Risk Confined Spaces

## Assessment Criteria

### **Outcome 1 Prepare to act as top man for high risk teams working in confined spaces**

The learner can:

1. Interpret the work plan and arrange for the necessary equipment to be available
2. Arrange for all required equipment to be available prior to entering the site
3. Determine work team activities
4. Put together a competent work team
5. Allocate activities to each team role
6. Confirm all team members know and understand their roles
7. Brief the work team on the nature of the specific confined space
8. Carry out a real-time risk assessment before starting work
9. Organise and maintain a safety zone around the work site
10. Confirm communications systems are set up, tested, and are working before team move away from the entry point.

### **Outcome 2 Oversee safe entry and exit to high risk confined spaces**

The learner can:

1. Check atmospheric conditions are safe before the work team enters the confined space
2. Oversee and check the work team enter and exit in line with procedures
3. Make sure procedures regarding the carrying and use of appropriate respiratory protective equipment (RPE) are followed
4. Make sure the work team use the detection equipment and entry equipment correctly
5. Remedy any incorrect activities with the team member
6. Oversee recovery of equipment and tools from site when work is finished.

### **Outcome 3 Monitor work of teams to ensure procedures are followed**

The learner can:

1. Control access of people and vehicles around the entry point
2. Resolve any problems connected to the work or team members with the designated personnel
3. Act immediately to remedy any unsafe activity, equipment, and environmental conditions
4. Monitor continuously the work team and ensure compliance with procedures
5. Monitor environmental readings regularly and respond to information from monitoring equipment
6. Communicate regularly with the work team at all stages of the work
7. Initiate site hygiene procedures
8. Close down and make the work area safe when work is finished
9. Make reports and complete all documentation and deposit them with the designated people.

## **Outcome 4 Prepare for and deal with emergencies**

The learner can:

1. Confirm the emergency arrangements, procedures and communications systems are in place and working properly
2. Make the emergency arrangements known to all work team, support personnel, and off-site personnel
3. Get all rescue equipment on site as specified in emergency procedures
4. Set up exclusion zones to prevent entry by unauthorised people following emergency situations
5. Arrange for rescue equipment to be in place before allowing entry to confined space
6. Start emergency procedures immediately a dangerous situation arises
7. Supervise exit procedures
8. Maintain control over work team members during an emergency
9. Supervise the use of emergency equipment
10. Follow and maintain emergency procedures throughout the incident
11. Record and report the emergency incident and its circumstances
12. Arrange for basic first aid to be available to recovered surface casualties
13. Maintain emergency communications
14. Hand-over to emergency services
15. Secure and maintain sites for post-rescue investigations.

## **Outcome 5 Use appropriate behaviour for carrying out top man work in high risk confined spaces**

The learner can:

1. demonstrate that they are vigilant to possible risks and hazards

## **Outcome 6 Use appropriate knowledge for carrying out top person work in high risk confined spaces**

The learner can:

1. Understand their responsibilities to comply with the main principles of health and safety and environmental legislation and regulations
2. Know about Industrial Standards
3. Have a working knowledge of the approved codes of practice and guidance for working safely in confined spaces
4. Know about the definition of confined spaces and their nature and characteristics
5. Know about the definitions of hazardous situations and different types and categories of hazards
6. Know how emergency situations can arise in a confined space
7. Know about manufacturers' instructions relating to the use of equipment, tools, and appropriate RPE
8. Know about manufacturers' instructions relating to the use of PPE
9. Know about legislation and approved codes of practice and guidelines for safe use of appropriate RPE for working and escape purposes
10. Know about the limitations for using rescue equipment
11. Know about working as a member of a team
12. Know about the different roles and responsibilities for dealing with emergencies
13. Know how to deal with injuries to personnel and the general public
14. Know how to deal with irregularities and abnormal situations
15. Know about the different types and categories of emergency situation.

## **Outcome 7    Apply relevant industry standards for top person work in high risk confined spaces**

The learner can:

1. Map organisations' classifications into National Occupational Standards for confined spaces
2. Understand the hazards, substances, and situations associated with contaminated atmospheres
3. Understand entry procedures for different types and risk levels of confined spaces environments
4. Understand how to carry out real-time assessment of risks and hazards
5. Understand how to use work authorizations and permits
6. Understand procedures and methods of working suitable to the confined space risk level and local conditions
7. Understand how to minimise the risks and hazards for the work to be carried out
8. Understand how to use ventilation systems
9. Understand how to reduce risk and injury
10. Understand and use local procedures
11. Understand how to monitor conditions and work activity
12. Understand decontamination procedures
13. Understand communications methods which are suitable for the site and its conditions
14. Understand how to resolve problems speedily and with the designated personnel
15. Understand how to follow manufacturers' instructions for using equipment
16. Understand how to prepare and check equipment
17. Understand how to ensure equipment and tools are fit-for-purpose and how to use them safely
18. Understand methods and techniques for using and wearing PPE
19. Understand how to prepare and use appropriate RPE for working and escape purposes
20. Understand the responsibilities of a rescue team and its individual members
21. Understand the responsibilities of managing work teams
22. Understand reporting systems for routine work activities and resolving problems
23. Understand procedures for dealing with emergencies
24. Understand rescue and recovery procedures in emergency situations
25. Understand communications and reporting systems for emergency situations.

**Level:** 5  
**Credit value:** 14  
**UAN:** A/504/0399

**Unit aim****Learning outcomes**

There are **three** learning outcomes to this unit. The learner will:

1. Understand the concept and importance of knowledge management in terms of an organisation's knowledge assets and their management
2. Understand the key knowledge management processes required for innovation
3. Be able to develop a framework for establishing a knowledge management culture.

**Guided learning hours**

Although patterns of delivery are likely to vary considerably, it is recommended that **14** hours should be allocated for this unit.

**Endorsement of the unit by a sector or other appropriate body**

This unit is endorsed by e-skills UK.

**How is this unit assessed?**

This unit is assessed by portfolio of evidence.

# **Unit 4520-580      Knowledge and information management**

## Assessment Criteria

### **Outcome 1      Understand the concept and importance of knowledge management in terms of an organisation's knowledge assets and their management**

The learner can:

1. Explain the relationship between data, information, knowledge and wisdom
2. Explain the relationship between individual knowledge and organisational knowledge
3. Apply analysis and modelling techniques to identify knowledge assets, within own area of organisation
4. Evaluate the actual and potential knowledge assets, within own area of organisation
5. Present a rationale for capturing and managing knowledge, within own area of organisation.

### **Outcome 2      Understand the key knowledge management processes required for innovation**

The learner can:

1. Explain what is required to create, store, apply and integrate knowledge
2. Evaluate the impact of intellectual property rights on the organisation.

### **Outcome 3      Be able to develop a framework for establishing a knowledge management culture.**

The learner can:

1. Explain the contribution that significant knowledge assets have on the organisation
2. Evaluate the knowledge requirements for the organisation's operations
3. Evaluate the organisations current framework for enabling knowledge sharing within the organisation
4. Recommend improvements to the organisations current framework for enabling knowledge sharing within the organisation.

## Appendix 1      Glossary

<b>Agree</b>	to reach a joint decision (with one or more person(s))
<b>Analyse</b>	to study or examine a topic in detail, in order to discover more about it
<b>Annotation</b>	words/notes written on material (eg photographs or text) usually to personalise or clarify the material
<b>Assessor observation</b>	written evidence produced by the assessor to record what they have observed the learner doing
<b>Attitude</b>	the way a person views something (NB learners do not have to distinguish between skills, qualities and attitudes)
<b>Learner portfolio</b>	see 'portfolio'
<b>Learner statement</b>	information provided by the learner which can be hand written, typed or presented as a video or audio recording
<b>Choose</b>	select from a number of alternatives
<b>Decide</b>	reach a decision eg by considering options (these options may be suggested by the learner or another person)
<b>Define</b>	say (orally or in writing) what the meaning of something, especially a word, is (eg defining a particular term)
<b>Demonstrate</b>	show how something should be done. This is evidence of performance.
<b>Describe</b>	give details, to say or write what someone or something is like
<b>Evaluate</b>	to judge or calculate the quality, importance, amount or value of something
<b>Explain</b>	to make something clear or easy to understand by describing or giving information about it
<b>Identify</b>	to recognise something (or someone) and say (or prove) what (or who) they are
<b>List</b>	to make a list of at least two items. This could be a written list produced by the learner (eg hand written, using ICT, by highlighting or cutting and pasting from given source materials). Oral evidence could be recorded as an assessor observation, audio recording or a record of questioning.
<b>Outline</b>	give a general explanation or description without detail
<b>Portfolio</b>	a collection of evidence which meets the assessment criteria. This can be paper based and/or stored electronically (ie e-portfolio).
<b>Qualities</b>	distinguishing characteristics or attributes; a feature of personality (NB learners do not have to distinguish between skills, qualities and attitudes)
<b>Range</b>	at least three
<b>Research</b>	find information eg from a variety of oral and/or written sources
<b>Skill</b>	special ability or expertise, often acquired through training (NB learners do not have to distinguish between skills, qualities and attitudes)
<b>State</b>	can be written or oral evidence. Evidence for oral contribution could be an assessor record of questioning.
<b>UAN</b>	Unit accreditation number
<b>Use</b>	to put something such as a tool or skill to a particular purpose
<b>Witness statement</b>	written evidence produced by someone other than the assessor to record what they have observed the learner doing

# Useful contacts

## UK learners

**E: [learnersupport@cityandguilds.com](mailto:learnersupport@cityandguilds.com)**

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## International learners

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Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results

**E: [centresupport@cityandguilds.com](mailto:centresupport@cityandguilds.com)**

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## Single subject qualifications

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Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change

F: +44 (0)20 7294 2404 (BB forms)

**E: [singlesubjects@cityandguilds.com](mailto:singlesubjects@cityandguilds.com)**

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## International awards

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Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports

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## Walled Garden

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Re-issue of password or username, Technical problems, Entries, Results, GOLLA, Navigation, User/menu option, Problems

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