Level 1-4 Certificate/Diplomas in ICT Professional Competence (4520)

Level 1-4 Units handbook for centres

Level 1-4 Certificate/Diplomas in ICT Professional Competence (4520)

City& Guilds

Level 1-4 Units handbook for centres

Qualification title	Number	Ofqual ref.
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

City & Guilds
Skills for a brighter future

City&Guilds

www.cityandguilds.com

Contents

City & Guilds
Skills for a brighter future

City&
Guilds

www.cityandguilds.com

City & Guilds
Skills for a brighter future

1   Introduction to this Units handbook

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

Level 1 Certificate in ICT Professional Competence	501/1671/X
Level 2 Diploma in ICT Professional Competence	501/1789/0
Level 3 Diploma in ICT Professional Competence	501/1788/9
Level 4 Diploma in ICT Professional Competence	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**

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.

Unit 4520-100   Improving Productivity Using IT

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

Learning outcomes

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

1. Plan the use of appropriate IT systems and software to meet requirements
2. Use IT systems and software efficiently to complete planned tasks
3. 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 (if required)

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   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   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   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

Unit 4520-101   Customer Care in ICT

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

Learning outcomes

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

1. Know how to provide customer care in a familiar context
2. 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 (if required)

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 (e.g. intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (e.g. smiling while talking on the phone, body language).
   - attentive listening (i.e. 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 (e.g. how to log customer information, how to initiate service calls, how to complete a sale);
   - authorisation procedures (e.g. how to confirm caller identity, how to validate requests);
   - escalation, resolution and complaint handling;
   - quality assurance procedures;
   - compliance with relevant legislation and regulations (e.g. 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   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.

Unit 4520-102   Health and Safety in ICT

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

Learning outcomes
There is **one** learning outcome to this unit. The learner will be able to:
1.   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 (if required)
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   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.

Unit 4520-103 Interpersonal and written communication

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

Learning outcomes

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

1. Communicate interpersonally on a familiar subject in a familiar work situation
2. 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 (if required)

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   Communicate interpersonally on a familiar subject in a familiar work situation

The learner can:

1   Apply knowledge of the following interpersonal communication techniques:

• verbal (e.g. intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (e.g. smiling while talking on the phone, body language).
• attentive listening (i.e. difference between hearing and listening).
• positive and negative language.

2   Communicate verbally following organisational guidelines and procedures

Outcome 2   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 (e.g. letter, fax, email, database notes);
• using correct grammar and spelling.

Unit 4520-106 Remote Support for Products or Services

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

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:
1. Know the specified parts of customer care requirements and details of the supported products and services that apply to them
2. 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 (if required)

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 (e.g. how to log customer information, how to initiate service calls, how to complete a sale);
   - authorisation procedures (e.g. how to confirm caller identity, how to validate requests);
   - escalation, resolution and complaint handling;
   - quality assurance procedures;
   - compliance with relevant legislation and regulations (e.g. data protection, financial services);
   - maintenance and communication of organisational brand or image;
   - organisational aims and objectives.

Outcome 2   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 (e.g. 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.

Unit 4520-107   Security of ICT Systems

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

Learning outcomes

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

1. Know the particular threats to an IT system and its data with specified methods and procedures for protecting it.
2. 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 (if required)

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 (e.g. by positioning of monitors, using encryption);
    - shielding (e.g. 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   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 (e.g. passwords, anti-virus software, firewalls and encryption facilities)
    - external tools (e.g. access control devices)
2. Comply with organisational security procedures.

Unit 4520-108   Software Installation and Upgrade

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

Learning outcomes

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

1. Understand specified parts of the installation/upgrade process
2. 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 (if required)

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   Be aware of the importance of personal presentation
The learner can:
1.   Describe specified installation/upgrade procedures to include:

- installation
- configuration
- testing
- delivery, shipping and storage;
- escalation;

Outcome 2   Be aware of the importance of personal hygiene
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

Unit 4520-109　　　System Operation

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

Learning outcomes

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

1. Know the functionality of specified parts of the system
2. 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 (if required)

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 (e.g. availability, quality);
   - routine maintenance;
   - monitoring;
   - data integrity (e.g. backups, anti-virus);
   - consumables use, storage & disposal;
   - Health & Safety;
   - escalation;
   - information recording and reporting;
   - obtaining work permissions;
   - security & confidentiality.

Outcome 2 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.

Unit 4520-110 Technical advice and guidance

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

Learning outcomes

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

1. Know the information relating to the advice and guidance they are required to give and the relevant parts of the organisational policy
2. 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 (if required)

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   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 (e.g. 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

Unit 4520-111 Technical fault diagnosis

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

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:
1. Know the procedures and other information within the diagnostic process that applies to them
2. 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 (if required)

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   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

Unit 4520-113   Testing ICT Systems

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

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:
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. 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 (if required)

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 (e.g. 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   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 (e.g. 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.

Unit 4520-114 Working with ICT hardware and equipment

Level: 1
Credit value: 9
UAN: F/502/0445

Learning outcome

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

1. Know how to carry out work under direction
2. Carry out work under direction

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 (if required)

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 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

Learning outcomes

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

1. Obtain, insert and combine information for images
2. 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 (if required)

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   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   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

Unit 4520-172 Database Software

Level: 1

Credit value: 3

UAN: H/502/4553

Learning outcomes

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

1. Enter, edit and organise structured information in a database
2. 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 (if required)

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 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 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

Unit 4520-173   Using Email

Level: 1
Credit value: 2
UAN: J/502/4299

Learning outcomes
There are **two** learning outcomes to this unit. The learner will be able to:
1. Use e-mail software tools and techniques to compose and send messages
2. 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 (if required)
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   Use e-mail software tools and techniques to compose and send messages

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

Outcome 2   Manage incoming email effectively

The learner can:
1. Follow guidelines and procedures for using e-mail
2. Identify when and how to respond to e-mail messages
3. Read and respond to e-mail messages appropriately
4. Identify what messages to delete and when to do so
5. Organise and store e-mail messages
6. Respond appropriately to common e-mail problems

Unit 4520-174   Using the internet

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

Learning outcomes

There are **five** learning outcomes to this unit. The learner will be able to:
1. Connect to the internet
2. Use browser software to navigate web pages
3. Use browser tools to search for information from the internet
4. Use browser software to communicate information online
5. 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 (if required)

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   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   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 5   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   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   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

Unit 4520-175   Presentation Software

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

Learning outcomes

There are **three** learning outcomes to this unit. The learner will be able to:
1. Input and combine text and other information within presentation slides
2. Use presentation software tools to structure, edit and format slides
3. 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 (if required)

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   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   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   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

Unit 4520-176   Spreadsheet Software

Level: 1
Credit value: 3
UAN: A/502/4624

Learning outcome

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

1. Use a spreadsheet to enter, edit and organise numerical and other data
2. Use appropriate formulas and tools to summarise and display spreadsheet information
3. 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 (if required)

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   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   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   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

Unit 4520-177   Website Software

Level: **1**

Credit value: **3**

UAN: **L/502/4630**

Learning outcome

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

1. Plan and create web pages
2. Use website software tools to structure and format web pages
3. 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 (if required)

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   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   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   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

Unit 4520-178   Word Processing Software

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

Learning outcome

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

1. Enter, edit and combine text and other information accurately within word processing documents
2. Structure information within word processing documents
3. 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 (if required)

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   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   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   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

Unit 4520-179   Desktop Publishing Software

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

Learning outcome

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

1. Select and use appropriate designs and page layouts for publications
2. Input and combine text and other information within publications
3. 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 (if required)

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   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   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   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

Unit 4520-180   Design Software

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

Learning outcomes
There are **two** learning outcomes to this unit. The learner will be able to:
1. Obtain, insert and combine information for designs
2. 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 (if required)
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   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   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

Unit 4520-186   CompTIA Strata Fundamentals of IT Technology

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

Learning outcomes

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

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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Must be assessed using the relevant CompTIA test.

Unit 4520-186   CompTIA Strata Fundamentals of IT Technology

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 Compatibility Issues and Common Errors

The learner can:

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

Unit 4520-187　CompTIA Strata - Fundamentals of PC Functionality

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

Learning outcomes

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

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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Must be assessed using the relevant CompTIA test.

Unit 4520-187   CompTIA Strata - Fundamentals of PC Functionality

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

Unit 4520-201   Customer Care in ICT

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

Learning outcomes
There are **two** learning outcomes to this unit. The learner will be able to:
1. Know how to provide customer care by establishing customer relationships
2. 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 (if required)
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 (e.g. intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (e.g. smiling while talking on the phone, body language).
    - attentive listening (i.e. difference between hearing and listening).
    - positive and negative language.
    - active listening (e.g. summarising, paraphrasing, body language);
    - listening barriers (e.g. background noise, distractions, lack of concentration);
    - types of question (e.g. open, closed and probing)
2. Describe the relevant parts of the organisational requirements for customer care including;
    - customer service procedures (e.g. how to log customer information, how to initiate service   calls, how to complete a sale);
    - authorisation procedures (e.g. how to confirm caller identity, how to validate requests);
    - escalation, resolution and complaint handling;
    - quality assurance procedures;
    - compliance with relevant legislation and regulations (e.g. 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   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 (e.g. by taking notes)
    - clarifying and confirming understanding (e.g. 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

Unit 4520-203 Interpersonal and written communication

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

Learning outcomes

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

1. Send and receive familiar information by communicating interpersonally in familiar situations
2. 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 (if required)

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 Send and receive familiar information by communicating interpersonally in familiar situations

The learner can:

1. Apply knowledge of the following interpersonal communication techniques:
   - verbal (e.g. intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (e.g. smiling while talking on the phone, body language).
   - attentive listening (i.e. difference between hearing and listening).
   - positive and negative language.
   - active listening (e.g. summarising, paraphrasing, body language);
   - listening barriers (e.g. background noise, distractions, lack of concentration);
   - types of question (e.g. 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 (e.g. by taking notes)
   - clarifying and confirming understanding (e.g. 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 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 (e.g. 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 (e.g. letter, memo, fax, e-mail, 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.

Unit 4520-204 Develop own effectiveness and professionalism

Level: 2
Credit value: 3
UAN: Y/601/3317

Learning outcomes

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

1. Develop own personal and professional skills
2. 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. 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 (if required)

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   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   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   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

Unit 4520-205 Introduction to IT systems development

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

Learning outcomes

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

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 (if required)

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

Unit 4520-206   Remote Support for Products and Services

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

Learning outcomes

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

1. Know relevant parts of customer care requirements and details of the supported products and services
2. 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 (if required)

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 (e.g. how to log customer information, how to initiate service calls, how to complete a sale);
   - authorisation procedures (e.g. how to confirm caller identity, how to validate requests);
   - escalation, resolution and complaint handling;
   - quality assurance procedures;
   - compliance with relevant legislation and regulations (e.g. data protection, financial services);
   - maintenance and communication of organisational brand or image;
   - organisational aims and objectives

Outcome 2   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 (e.g. 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

Unit 4520-208 Software installation and upgrade

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

Learning outcomes

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

1   Understand relevant parts of the installation/upgrade process
2   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 (if required)

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 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.

Unit 4520-209   ICT System Operation

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

This may include:
- using data backup and restore routines
- handling of incidents
- controlling and monitoring availability and performance of system components
- start-up/close-down routines
- scheduling routine or preventative maintenance
- maintenance of operating plans and schedules.

Examples of 'operational activities' are:
- replenishment of consumables
- routine or preventative maintenance
- data backups.

A competent person at level 2 can operate a system under instruction.

Learning outcomes
There are **two** learning outcomes to this unit. The learner will be able to:
1. Know the relevant parts of the operating system
2. 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 (if required)
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 (e.g. availability, quality);
    - routine maintenance;
    - monitoring;
    - data integrity (e.g. 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 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

Unit 4520-210   Technical advice and guidance

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

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:
1. Know how to provide technical advice and guidance
2. 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 (if required)

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 (e.g. to rectify known faults, to provide new functionality).

Outcome 2　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

Unit 4520-211 Technical fault diagnosis

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

Learning outcomes

There are **four** learning outcomes to this unit. The learner will be able to:
1. Know the process, methods and information that are used in the diagnostic process
2. Apply processes to diagnose faults with a known range of causes and assist in the diagnosis of other faults
3. Select fault remedies from given alternatives
4. 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 (if required)

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, e.g.
    - minimisation of service disruption during diagnostics
    - individual responsibility and authority
    - escalation procedure
    - level of service

Outcome 2   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 e.g.
    - 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   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   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

Learning outcomes

There are **four** learning outcomes to this unit. The learner will be able to:
1. Describe Projects and Project Management
2. Demonstrate an understanding of the principles of project management
3. Describe the typical activities within system and project life-cycles
4. 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 (if required)

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   Describe Projects and Project Management

The learner can:

1. Identify 3 different types of project organisation structure
2. Identify key roles and responsibilities within a project's organisation structure ie
   - Sponsor (Executive)
   - Users
   - Suppliers
   - Project Manager
   - Team Manager (Leader)
   - Project Support Office
3. Create key project documentation
   - Project Plan
   - The Business Case
   - The Project Management Plan (PMP)
   - Project Initiation Document (PID)
4. 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
5. Calculate the viability of a project using Investment Appraisal techniques
   - Payback period
   - Discounted Cash Flow (DCF) / Net Present Value (NPV)
6. Calculate the Return on investment (ROI) for a given project

Outcome 2   Demonstrate an understanding of the principles of project management

The learner can:

1. Collect and present progress information
2. Create a basic project estimate
3. Tailor the amount of planning effort required for different projects
4. Separate the constraints from the dependencies.

Outcome 3   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   Apply the principles of project planning and control

The learner can:

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

Unit 4520-213   Testing ICT Systems

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

Learning outcomes

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

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. 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 (if required)

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 (e.g. ensuring network service continuity)
   - data integrity (e.g. taking data backups before commencing work)
   - resource availability
   - level of service allowed by the SLA
   - environmental legislation and regulations (e.g. disposal of materials)
   - work sign-off and reporting
   - site restoration .system and equipment integrity (e.g. restoring service)
   - data integrity (e.g. restoring data backups as necessary)
3. Interpret technical information on a specified range of products.

Outcome 2   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

Unit 4520-214   Working with ICT hardware and equipment

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

Learning outcomes

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

1. Know how to plan and carry out a range of ICT hardware and equipment work activities under direction
2. Plan and carry out a range of ICT hardware and equipment work activities under direction
3. 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 **45** hours should be allocated for this unit.

Endorsement of the unit by a sector or other appropriate body (if required)

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 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   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

Unit 4520-215   Computer Games Development

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

Learning outcomes

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

1. Know computer game components and the computer games industry
2. Know how to develop a computer game specification
3. 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 (if required)

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   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**

Learning outcomes

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

1. Know the basic concepts of logical data modelling
2. 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 (if required)

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   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

Unit 4520-217　　　System Management

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

Learning outcomes

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

1. Know how to assist in administering a system
2. 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 (if required)

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 (e.g. manufacturer, type, revision, serial number, location, value);
    • Configuration (e.g. physical and logical addresses, options set, connections).

Outcome 2   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.

Unit 4520-219   User Profile Administration

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

Learning outcomes

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

1. Know how to assist in the administration of user profiles
2. 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 (if required)

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 (e.g. change frequency);
    *   allowed system access (e.g. times, locations)
    *   allowed access to facilities (e.g. data, software)

Outcome 2   Assist in the administration of user profiles

The learner can:

1. Make specified changes to user profiles

Unit 4520-220 Creating an object oriented computer program

Level: 2
Credit value: 6
UAN: A/601/3181

Learning outcomes

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

1. Implement software using object oriented programming
2. Refine an object oriented program to improve quality
3. 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 **55** hours should be allocated for this unit.

Endorsement of the unit by a sector or other appropriate body (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-220 Creating an object oriented computer program

Assessment Criteria

Outcome 1 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)

Outcome 2 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

Outcome 3 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

Unit 4520-221   Creating a procedural computer program

Level: **2**

Credit value: **7**

UAN: **L/601/3167**

Learning outcomes

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

1. Implement software using procedural programming
2. Refine an object oriented program to improve quality
3. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-221 Creating a procedural computer program
Assessment Criteria

Outcome 1 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

Outcome 2 Refine a procedural programme 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

Outcome 3 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

Unit 4520-222   Creating an event driven computer program

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

Learning outcomes

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

1. Implement software using event driven programming
2. Refine an event driven program to improve quality
3. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-222   Creating an event driven computer program

Assessment Criteria

Outcome 1   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)

Outcome 2   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

Outcome 3   Test the operation of a procedural programme

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

Unit 4520-229 CompTIA A+ Essentials

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

Learning outcomes

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

1. 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 (if required)

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   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

Unit 4520-230   CompTIA A+ Practical Application

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

Learning outcomes

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

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 (if required)

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   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

Unit 4520-232   Cisco IT Essentials Part 1

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

Learning outcomes

There are **four** learning outcomes to this unit. The learner will be able to:
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 (if required)

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 troubles hooting 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 s elect components of a printer/ s canner; 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 troubles hooting
2. Explain, install, and navigate an operating system; upgrade components based on customer need s 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

Unit 4520-237　　Supporting Users and Troubleshooting a Microsoft Windows XP Operating System

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

Learning outcomes

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

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. Configuring and Troubleshooting 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Must be assessed by using the relevant Microsoft test.

Unit 4520-237   Supporting Users and Troubleshooting a Microsoft Windows XP Operating System

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   Configuring and Troubleshooting 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**

Learning outcomes

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

1. Configuring and Troubleshooting Applications
2. Resolving Issues Related to Usability
3. Resolving Issues Related to Application Customization
4. Configuring and Troubleshooting Connectivity for Applications
5. Configuring 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Must be assessed by using the relevant Microsoft test.

Unit 4520-238 Supporting Users and Troubleshooting Desktop Applications on a Microsoft Windows XP Operating System

Assessment Criteria

Outcome 1 Configuring and Troubleshooting 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 Resolving 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 Resolving 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 Configuring and Troubleshooting 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   Configuring 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

Unit 4520-239   Configuring Microsoft Windows Vista Client

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

Learning outcomes

There are **seven** learning outcomes to this unit. The learner will be able to:
1.   Install and upgrade Windows Vista
2.   Configure and troubleshoot Post-installation system settings
3.   Configure Windows security features
4.   Configure network connectivity
5.   Configure applications included with Windows Vista
6.   Maintain and optimize systems that run Windows Vista
7.   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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Must be assessed by using the relevant Microsoft test.

Unit 4520-239　　Configuring Microsoft Windows Vista Client

Assessment Criteria

Outcome 1　　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　　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　　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　　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   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   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   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

Learning outcomes

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

1. Deploy Windows Vista
2. Manage Windows Vista Security
3. Manage and Maintain Systems That Run Windows Vista
4. Configure and Troubleshoot Networking
5. Supporting and Maintaining 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-240 Supporting and Troubleshooting Applications on a Windows Vista Client for Enterprise Support Technicians

Assessment Criteria

Outcome 1 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 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 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   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   Supporting and Maintaining 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**

Learning outcomes

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

1. Install and upgrade Windows Vista
2. Customize and Configure Settings; Post-Installation:
3. Configure Windows security
4. Configure, Troubleshoot, and Repair Networking
5. Install, Configure, and Troubleshoot Devices
6. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-241 Supporting and Troubleshooting Applications on a Windows Vista Client for Consumer Support Technicians

Assessment Criteria

Outcome 1 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 Configure and troubleshoot Post-installation system settings

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 Configure Windows security features

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 Configure network connectivity

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   Configure applications included with Windows Vista

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   Maintain and optimize systems that run 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

Learning outcomes

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

1. Deploy the 2007 Microsoft Office System
2. Configure Windows Vista Automated Installation Settings
3. Deploy Windows Vista
4. Use Business Desktop Deployment (BDD) Workbench
5. Use the Application Compatibility Toolkit
6. Managing 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Must be assessed by using the relevant Microsoft test.

Unit 4520-242 Deploying and Maintaining Windows Vista Client and 2007 Microsoft Office System Desktops

Assessment Criteria

Outcome 1   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   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   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   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   Use 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   Managing 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

Unit 4520-243   Configuring Windows 7

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

Learning outcomes

There are **seven** learning outcomes to this unit.

The learner will be able to:

1. Install Upgrade, and Migrate to Windows 7
2. Deploy Windows 7
3. Configure Hardware and Applications
4. Configure Network Connectivity
5. Configure Access to Resources
6. Configure Mobile Computing
7. 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 (if required)

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   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   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   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   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   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   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   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.

Unit 4520-252   MTA: Software Development Fundamentals

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

Learning outcomes

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

1. Understanding Core Programming
2. Understanding Object-Oriented Programming
3. Understanding General Software Development
4. Understanding Web Applications
5. Understanding Desktop Applications
6. Understanding 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 (if required)

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   Understanding 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   Understanding Object-Oriented Programming

The learner can:

1. Understand the fundamentals of classes
2. Understand inheritance
3. Understand polymorphism
4. Understand encapsulation

Outcome 3   Understanding General Software Development

The learner can:

1. Understand application life cycle management
2. Interpret application specifications
3. Understand algorithms and data structures)

Outcome 4   Understanding 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   Understanding Desktop Applications

The learner can:

1. Understand Windows® Forms applications
2. Understand console-based applications
3. Understand Windows Services

Outcome 6   Understanding Databases

The learner can:

1. Understand relational database management systems
2. Understand database query methods
3. Understand database connection methods

Unit 4520-253   MTA: Windows Development Fundamentals

Level: **2**
Credit value: **10**
UAN: **T/602/6348**

Learning outcomes

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

1. Understanding Windows Programming Basics
2. Creating Windows Forms Applications
3. Creating Windows Services Applications
4. Accessing Data in a Windows Forms Application
5. Deploying 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 (if required)

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   Understanding 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   Creating 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   Creating Windows Services Applications

The learner can:

1. Create a Windows Services application
2. Install a Windows Services application

Outcome 4   Accessing Data in a Windows Forms Application

The learner can:

1. Understand data access methods for a Windows Application
2. Understand databound controls

Outcome 5   Deploying a Windows Application

The learner can:

1. Understand Windows application deployment methods
2. Create Windows setup and deployment projects

Unit 4520-254   MTA: Security Development Fundamentals

Level: **2**
Credit value: **10**
UAN: **A/602/6349**

Learning outcomes

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

1. Understanding Security Layers
2. Understanding Operating System Security
3. Understanding Network Security
4. Understanding 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 (if required)

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   Understanding Security Layers

The learner can:

1. Understand core security principles
2. Understand physical security
3. Understand Internet security
4. Understand wireless security

Outcome 2   Understanding 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   Understanding 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   Understanding Security Software

The learner can:

1. Understand client protection
2. Understand e-mail protection
3. Understand server protection

Unit 4520-255   MTA: Networking Fundamentals

Level: **2**
Credit value: **10**
UAN: **M/602/6350**

Learning outcomes

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

1. Understanding Network Infrastructures
2. Understanding Network Hardware
3. Understanding 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 (if required)

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   Understanding 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   Understanding Network Hardware

The learner can:

1. Understand switches
2. Understand routers
3. Understand media types

Outcome 3   Understanding 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

Unit 4520-256   MTA: Windows Server Administration Fundamentals

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

Learning outcomes

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

1. Understanding Server Installation
2. Understanding Server Roles
3. Understanding Active Directory
4. Understanding Storage
5. Understanding Server Performance Management
6. Understanding 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 (if required)

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   Understanding Server Installation

The learner can:

1. Understand device drivers
2. Understand services
3. Understand server installation options

Outcome 2   Understanding 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   Understanding 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   Understanding Storage

The learner can:

1. Identify storage technologies
2. Understand RAID
3. Understand disk types

Outcome 5   Understanding Server Performance Management

The learner can:

1. Identify major server hardware components
2. Understand performance monitoring
3. Understand logs and alerts

Outcome 6   Understanding Server Maintenance

The learner can:

4. Identify steps in the startup process
5. Understand business continuity
6. Understand updates
7. Understand troubleshooting methodology

Unit 4520-257   MTA: Database Administration Fundamentals

Level: **2**
Credit value: **10**
UAN: **A/602/6352**

Learning outcomes

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

1. Understanding Core Database Concepts
2. Creating Database Objects
3. Manipulating Data
4. Understanding Data Storage
5. Administering 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 (if required)

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　Understanding 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　Creating 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　Manipulating Data

The learner can:

1. Select data
2. Insert data
3. Update data
4. Delete data

Outcome 4　Understanding Data Storage

The learner can:

1. Understand normalization
2. Understand primary, foreign, and composite keys
3. Understand indexes

Outcome 5　Administering a Database

The learner can:

1. Understand database security concepts
2. Understand database backups and restore

Unit 4520-258   MTA: Web Development Fundamentals

Level: **2**
Credit value: **10**
UAN: **F/602/6353**

Learning outcomes

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

1. Programming Web Applications
2. Working with Data and Services
3. Troubleshooting and Debugging Web Applications
4. Working with Client-Side Scripting
5. Configuring and Deploying 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 (if required)

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   Programming 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   Working 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   Troubleshooting and Debugging Web Applications

The learner can:

1. Debug a Web application
2. Handle Web application errors

Outcome 4   Working with Client-Side Scripting

The learner can:

1. Understand client-side scripting.
2. Understand AJAX concepts

Outcome 5   Configuring and Deploying 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

Learning outcomes

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

1. Obtain, insert and combine information for images
2. 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 (if required)

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   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   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

Unit 4520-272   Database Software

Level: 2
Credit value: 4
UAN: M/502/4555

Learning outcomes

There are **three** learning outcomes to this unit. The learner will be able to:
1. Create and modify non-relational database tables
2. Enter, edit and organise structured information in a database
3. 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 (if required)

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   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   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   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

Unit 4520-273   Using Email

Level: 2
Credit value: 3
UAN: M/502/4300

Learning outcomes

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

1. Use e-mail software tools and techniques to compose and send messages
2. Manage incoming e-mail 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 (if required)

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 Use e-mail software tools and techniques to compose and send messages

The learner can:

1. Select and use software tools to compose and format e-mail messages, including attachments
2. Determine the message size and how it can be reduced
3. Send e-mail messages to individuals and groups
4. Describe how to stay safe and respect others when using e-mail
5. Use an address book to organise contact information

Outcome 2 Manage incoming e-mail effectively

The learner can:

1. Follow guidelines and procedures for using e-mail
2. Read and respond to e-mail messages appropriately
3. Use email software tools and techniques to automate responses
4. Describe how to archive e-mail messages, including attachments
5. Organise, store and archive e-mail messages effectively
6. Respond appropriately to e-mail problems

Unit 4520-274   Using the Internet

Level: 2
Credit value: 4
UAN: A/502/4297

Learning outcomes

There are **five** learning outcomes to this unit. The learner will be able to:
1. Connect to the Internet
2. Use browser software to navigate webpages effectively
3. Use browser tools to search for information from the Internet
4. 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 (if required)

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 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 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 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 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

Unit 4520-275 Presentation Software

Level: 2
Credit value: 4
UAN: M/502/4622

Learning outcomes

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

1. Input and combine text and other information within presentation slides
2. Use presentation software tools to structure, edit and format slide sequences
3. 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 (if required)

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 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 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 Prepare slideshow for presentation

The learner can:

5. Describe how to present slides to meet needs and communicate effectively
6. Prepare slideshow for presentation
7. Check presentation meets needs, using IT tools and making corrections as necessary
8. Identify and respond to any quality problems with presentations to ensure that presentations meet needs

Unit 4520-276 Spreadsheet Software

Level: 2
Credit value: 4
UAN: F/502/4625

Learning outcomes

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

1. Use a spreadsheet to enter, edit and organise numerical and other data
2. Select and use appropriate formulas and data analysis tools to meet requirements
3. 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 (if required)

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   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   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   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

Unit 4520-277　　　Website Software

Level:　　　　2
Credit value:　4
UAN:　　　　R/502/4631

Learning outcomes

There are **three** learning outcomes to this unit. The learner will be able to:
1. Create structures and styles for websites
2. Use website software tools to prepare content for websites
3. 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 (if required)

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   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   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   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

Unit 4520-278   Word Processing Software

Level: 2
Credit value: 4
UAN: R/502/4628

Learning outcomes

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

1. Enter and combine text and other information accurately within word processing documents
2. Create and modify layout and structures for word processing documents
3. 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 (if required)

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   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   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   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

Unit 4520-279   Desktop Publishing Software

Level: **2**
Credit value: **4**
UAN: **D/502/4566**

Learning outcomes

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

1. Select and use appropriate designs and page layouts for publications
2. Input and combine text and other information within publications
3. 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 (if required)

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   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   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   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

Unit 4520-280 Design Software

Level: 2
Credit value: 4
UAN: T/502/4573

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:
1. Obtain, insert and combine information for designs
2. 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 (if required)

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   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   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

Unit 4520-281   Cisco Passport21 Aspire Fundamentals

Level: **2**
Credit value: **10**
UAN: **T/502/8980**

Learning outcomes

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

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 (if required)

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

Unit 4520-301   Customer Care in ICT

Level: **3**
Credit value: **12**
UAN: **F/500/7159**

Learning outcomes

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

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 (if required)

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

Unit 4520-302   Health and Safety in ICT

Level: 3
Credit value: 12
UAN: H/602/2943

Learning outcomes

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

1. Carry out formal Health & Safety risk assessments in an ICT workplace.
2. 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 (if required)

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   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   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

Unit 4520-303   Interpersonal and written communication

Level: **3**
Credit value: **12**
UAN: **A/500/7208**

Learning outcomes

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

1. Send and receive complex information by communicating interpersonally
2. Understand and use written communication techniques
3. 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 (if required)

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   Send and receive complex information by communicating interpersonally

The learner can:

1. Apply knowledge of the following interpersonal communication concepts:
   - verbal (e.g. intonation, tone and feedback (sometimes referred to as verbal attends)) and non-verbal techniques (e.g. smiling while talking on the phone, body language).
   - attentive listening (i.e. difference between hearing and listening).
   - positive and negative language.
   - active listening (e.g. summarising, paraphrasing, body language);
   - listening barriers (e.g. background noise, distractions, lack of concentration);
   - types of question (e.g. open, closed and probing).
   - how to adapt style (e.g. 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 (e.g. by taking notes)
   - clarifying and confirming understanding (e.g. 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 (e.g. letter, memo, e-mail and fax)
2. Use the following written communication techniques
   - following organisational guidelines and procedures;
   - identifying and conveying key messages in writing (e.g. 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 (e.g. letter, memo, fax, e-mail, 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 Provide guidance to immediate colleagues on how to communicate information

The learner can:

1. Provide guidance to immediate colleagues on how to communicate information

Unit 4520-304 Develop Own Effectiveness and Professionalism

Level: 3
Credit value: 9
UAN: H/601/3501

Learning outcomes

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

1. Develop own personal and professional skills
2. 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. 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 (if required)

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   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   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   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

Unit 4520-305 Investigating and defining customer requirements for ICT systems

Level: 3
Credit value: 12
UAN: R/601/3249

Learning outcomes

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

1. Investigate existing systems and processes
2. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-305 Investigating and defining customer requirements for ICT systems

Assessment Criteria

Outcome 1 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 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

Unit 4520-306   Remote Support for Products and Services

Level: **3**
Credit value: **12**
UAN: **D/500/7217**

Learning outcomes

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

1. Understand the organisational requirements for customer care and the supported products and services
2. 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 (if required)

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 (e.g. how to log customer information, how to initiate service calls, how to complete a sale);
    *   authorisation procedures (e.g. how to confirm caller identity, how to validate requests);
    *   escalation, resolution and complaint handling;
    *   quality assurance procedures;
    *   compliance with relevant legislation and regulations (e.g. data protection, financial services);
    *   maintenance and communication of organisational brand or image;
    *   organisational aims and objectives.

Outcome 2   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 (e.g. 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

Unit 4520-307   Security of ICT Systems

Level: **3**
Credit value: **12**
UAN: **D/500/7220**

Learning outcomes

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

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. Apply security measures
3. 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 (if required)

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
6. Describe specified data protection methods:
   - system data security facilities;
   - surveillance and monitoring methods;
   - effects of system configuration on data protection
7. Describe specified methods of providing physical security for ICT systems
   - access control devices (e.g. locks, biometric controls, CCTV) and their configuration
   - limiting visibility of data (e.g. by positioning of monitors, using encryption)
   - shielding (e.g. cable screening, Faraday cages)
   - types and appropriate uses of access records and authorisations
   - how to allocate access authority
8. Describe relevant organisational security procedures

Outcome 2 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 (e.g. passwords and permissions, malware scanning, firewall, VPN, authentication and encryption facilities)
   - external tools (e.g. access control devices)

Outcome 3 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

Unit 4520-308   Software installation and upgrade

Level: 3
Credit value: 12
UAN: R/500/7330

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:
1. Understand the installation/upgrade process
2. 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 (if required)

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　　Carry out or control a wide range of installations or upgrades

The learner can:

1. Configure and apply specified security tools to identify and prevent breaches of security
2. Obtain and allocate required materials
3. Select the installation/upgrade procedures to be followed
4. Select software loading facilities to be used

Unit 4520-309 System Operation

Level: 3
Credit value: 12
UAN: A/500/7340

Learning outcomes

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

1. Know how to operate the system
2. Operate systems
3. 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 (if required)

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 (e.g. availability, quality);
    - routine maintenance;
    - monitoring;
    - data integrity (e.g. 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   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   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

Unit 4520-310   Technical advice and guidance

Level: 3
Credit value: 12
UAN: J/601/3507

Learning outcomes

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

1. Understand the context for providing technical advice and guidance
2. Provide reactive technical advice and guidance to customers on a range of topics
3. 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 (if required)

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 (e.g. manuals, handbooks, manufacturer's specifications)
   • information derived from the analysis of data (e.g. trend analysis, fault logs)
   • online information (e.g. manufacturer's websites, technical fora, discussion groups)
3. Describe the procedures and constraints which can apply to the provision of technical advice and guidance (e.g. 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 (e.g. to rectify known faults, to provide new functionality)

Outcome 2　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　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

Unit 4520-311 Technical fault diagnosis

Level:	3
Credit value:	12
UAN:	A/601/3293

Learning outcomes

There are **four** learning outcomes to this unit. The learner will be able to:
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. Select remedies for non-routine faults
4. 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 (if required)

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   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   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 4520-312 IT Project Management 3

Level: 3
Credit value: 10
UAN: L/502/1114

Learning outcomes

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

1. Describe Programmes, Projects and Project Management, and the key differences when compared to Business As Usual (BAU)
2. Apply the principles of Project Risk Management
3. Apply the principles of Project Quality Management, Change Control and Configuration Management
4. Use different styles of management and types of communication within a project environment
5. Understand Team Building and Team Dynamics using standard models
6. Describe typical activities and the practical problems of estimating throughout a project / system development lifecycle
7. 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 (if required)

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   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   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   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   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   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   Apply project planning, monitoring, and control techniques

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
     Select resourcing priorities
11. Create a Cumulative resource chart
12. Interpret Earned Value figures
13. Create a graphical representation of progress information
14. Extrapolate Project Outcome using Earned Value Management (EVM) Data

Unit 4520-313   Testing ICT Systems

Level: 3
Credit value: 10
UAN: F/500/7355

Learning outcomes

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

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. 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 (if required)

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 (e.g. ensuring network service continuity)
    *   data integrity (e.g. taking data backups before commencing work)
    *   resource availability
    *   level of service allowed by the SLA
    *   environmental legislation and regulations (e.g. disposal of materials)
    *   work sign-off and reporting
    *   site restoration .system and equipment integrity (e.g. restoring service)
    *   data integrity (e.g. restoring data backups as necessary)
4. Interpret detailed technical information on a specified range of products

Outcome 2   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

Unit 4520-314 Working with ICT hardware and equipment

Level: 3
Credit value: 12
UAN: M/500/7383

Learning outcomes

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

1. Know how to plan and carry out or direct a wide range of work activities
2. Plan and carry out or direct a wide range of work activities
3. 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 (if required)

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   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   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

Unit 4520-315   Computer Games Development

Level: **3**
Credit value: **10**
UAN: **F/601/3165**

Learning outcomes

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

1. Understand computer game architecture and components
2. Understand the computer games industry
3. Be able to evaluate existing computer games
4. Develop a computer game specification
5. 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 (if required)

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   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   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

Learning outcomes

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

1. Understand the concepts of logical data modelling
2. Use data modelling techniques to create logical data models
3. 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 (if required)

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   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   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

Unit 4520-317   System Management

Level: 3
Credit value: 9
UAN: D/500/7332

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:
1. Understand how to administer a system
2. 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 (if required)

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 (e.g. manufacturer, type, revision, serial number, location, value);
   • Configuration (e.g. physical and logical addresses, options set, connections)
3. Describe how available options for system configuration affect functionality and capacity

Outcome 2   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)

Unit 4520-319   User Profile Administration

Level: 3
Credit value: 9
UAN: K/500/7379

Learning outcomes

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

1. Know how to administer user profiles
2. 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 (if required)

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   Know how 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 (e.g. change frequency);
   • allowed system access (e.g. times, locations)
   • allowed access to facilities (e.g. 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 (e.g. data storage, printers);
   • software;
   • data

Outcome 2   Administer user profiles

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

Unit 4520-320 Creating an object oriented computer program

Level: 3
Credit value: 12
UAN: L/601/3184

Learning outcomes

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

1. Implement a software design using object oriented programming
2. Refine an object oriented program to improve quality
3. Test the operation of an object oriented driven program
4. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-320 Creating an object oriented computer program

Assessment Criteria

Outcome 1 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

Outcome 2 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

Outcome 3 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

Outcome 4 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

Unit 4520-321   Creating a procedural computer program

Level: 3
Credit value: 12
UAN: R/601/3171

Learning outcomes

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

1. Implement a software design using procedural programming
2. Refine a procedural program to improve quality
3. Test the operation of a procedural driven program
4. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-321 Creating a procedural computer program

Assessment Criteria

Outcome 1 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

Outcome 2 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

Outcome 3 Test the operation of a procedural 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

Outcome 4 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

Unit 4520-322 Creating an event driven computer program

Level: 3
Credit value: 12
UAN: F/601/3179

Learning outcomes

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

1. Implement a software design using event driven programming
2. Refine an event driven program to improve quality
3. Test the operation of an event driven program
4. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-322   Creating an event driven computer program

Assessment Criteria

Outcome 1   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

Outcome 2   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

Outcome 3   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

Outcome 4   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

Unit 4520-326   Managing Software Development

Level: 3
Credit value: 12
UAN: T/500/6798

Learning outcomes

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

1. Understand the technical aspects of the software development work of others
2. 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 (if required)

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 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

Unit 4520-327   Quality Management of ICT Products and Services

Level: **3**
Credit value: **12**
UAN: **T/500/7210**

Learning outcomes

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

1. Understand specified organisational quality management procedures
2. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-327   Quality Management of ICT Products and Services

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   Monitor 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

Unit 4520-329   CompTIA Network + 2009

Level: 3
Credit value: 10
UAN: A/602/1393

Learning outcomes

There are **six** learning outcomes to this unit. The learner will be able to:
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 (if required)

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

Unit 4520-330   CompTIA Security+ 2008

Level: 3
Credit value: 10
UAN: L/602/1396

Learning outcomes

There are **six** learning outcomes to this unit. The learner will be able to:
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 (if required)

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

Unit 4520-331 CompTIA Server+ 2009

Level: 3
Credit value: 10
UAN: R/602/1397

Learning outcomes

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

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 (if required)

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

Unit 4520-332 Cisco IT Essentials Part 2

Level: 3
Credit value: 10
UAN: F/601/7457

Learning outcomes

There are **three** learning outcomes to this unit. The learner will be able to:
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 (if required)

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 troubles hooting

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

Unit 4520-333 Cisco Exploration Accessing the WAN

Level: 3
Credit value: 10
UAN: K/601/7422

Learning outcomes

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

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 (if required)

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

Unit 4520-334   Cisco Exploration LAN Switching and Wireless

Level: **3**
Credit value: **10**
UAN: **K/601/7453**

Learning outcomes

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

1. Be able to configure a switched and trunked VLAN infrastructure
2. Be able to test and troubleshoot a VLAN infrastructure
3. 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 (if required)

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   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

Unit 4520-335   Cisco Exploration Network Fundamentals

Level: 3
Credit value: 10
UAN: A/601/7537

Learning outcomes

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

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 (if required)

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

Unit 4520-336   Cisco Exploration Routing Protocols and Concepts

Level: 3
Credit value: 10
UAN: H/601/7421

Learning outcomes

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

1. Be able to identify and understand different routing protocols
2. Configure a router to communicate with a WAN infrastructure
3. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Must be examined by the related course Cisco test

Unit 4520-336 Cisco Exploration Routing Protocols and Concepts

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 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 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

Unit 4520-337   Configuring Microsoft Exchange Server 2007

Level: **3**
Credit value: **12**
UAN: **J/502/3556**

Learning outcomes

There are **five** learning outcomes to this unit. The learner will be able to:
1. Install and Configure Microsoft Exchange Servers
2. Configure Recipients and Public Folders
3. Configure the Exchange Infrastructure
4. Monitor and Report
5. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Must be assessed by using the relevant Microsoft test.

Unit 4520-337   Configuring Microsoft Exchange Server 2007

Assessment Criteria

Outcome 1   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   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   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   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   Configure Disaster Recovery

The learner can:

1. Configure backups
2. Recover messaging data
3. Recover server roles
4. Configure high availability

Unit 4520-338 Installing, Configuring and Administering MS Windows XP Professional

Level: 3
Credit value: 7
UAN: A/501/2604

Learning outcomes

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

1. Install Windows XP Professional
2. Implement and Conduct Administration of Resources
3. Implement, Manage, Monitor, and Troubleshoot Hardware Devices and Drivers
4. Monitor and Optimize System Performance and Reliability
5. Configure and Troubleshoot the Desktop Environment
6. Implement, Manage, and Troubleshoot Network Protocols and Services
7. 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 (if required)

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   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   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 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 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   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   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   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

Unit 4520-339 Implementing and Managing Microsoft Exchange Server 2003

Level: **3**
Credit value: **7**
UAN: **T/501/2827**

Learning outcomes

There are **five** learning outcomes to this unit. The learner will be able to:
1. Install, Configure, and Troubleshoot Exchange Server 2003
2. Manage, Monitor, and Troubleshoot Exchange Server Computers
3. Manage, Monitor, and Troubleshoot the Exchange Organisation
4. Manage Security in the Exchange Environment
5. 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 (if required)

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 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 2003l
3. Install, configure, and troubleshoot Exchange Server 2003 in a clustered environment
4. Upgrade from Exchange Server

Outcome 2 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 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 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   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

Unit 4520-340 Managing and Maintaining a Windows Server 2003 Environment

Level: 3
Credit value: 7
UAN: J/501/2606

Learning outcomes

There are **five** learning outcomes to this unit. The learner will be able to:
1. Manage and maintain physical and logical devices
2. Manage users, computers, and groups
3. Manage and maintain access to Resources
4. Manage and Maintain a Server Environment
5. 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 (if required)

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   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   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   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   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   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

Unit 4520-341 Implementing, Managing, and Maintaining a Windows Server 2003 Network Infrastructure

Level: 3
Credit value: 10
UAN: H/501/2824

Learning outcomes

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

1. Implement, Manage and Maintain IP Addressing
2. Implement, Manage, and Maintain Name Resolution
3. Implement, Manage, and Maintain Network Security
4. Implement, Manage, and Maintain Routing and Remote Access
5. 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 (if required)

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   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   Implement, Manage, and Maintain Name Resolution

The learner can:

8. Install and configure the DNS Server service
    • Configure DNS server options
    • Configure DNS zone options
    • Configure DNS forwarding
9. Manage DNS
    • Manage DNS zone settings
    • Manage DNS record settings
    • Manage DNS server options
10. Monitor DNS. Tools might include System Monitor, Event Viewer, Replication Monitor, and DNS debug logs

Outcome 3   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 Monitor ng
6. MMC snap-in, Event Viewer, and Network Monitor

Outcome 4   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   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

Unit 4520-342   Planning and Maintaining a Microsoft Windows Server 2003 Network Infrastructure

Level: 3
Credit value: 3
UAN: H/501/2712

Learning outcomes

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

1. Planning and Implementing Server Roles and Server Security
2. Planning, Implementing, and Maintaining a Network Infrastructure
3. Planning, Implementing, and Maintaining Routing and Remote Access
4. Planning, Implementing, and Maintaining Server Availability
5. Planning and Maintaining Network Security
6. 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 (if required)

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   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   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 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 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 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   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

Unit 4520-343 Implementing and Administering Security in a Microsoft Windows Server 2003 Network

Level: 3
Credit value: 7
UAN: R/501/2866

Learning outcomes

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

1. Implement, manage, and troubleshoot security policies
2. Implement, manage, and troubleshoot patch management infrastructure
3. Be able to implement, manage, and troubleshoot Security for Network Communications
4. 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 (if required)

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   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   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, e-mail 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 e-mail 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   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

Unit 4520-344   Windows 7, Enterprise Desktop Administrator

Level: 3
Credit value: 8
UAN: H/601/6799

Learning outcomes

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

1. Planning and Managing a Client Life Cycle Strategy
2. Designing a Standard Image
3. Designing Client Configurations
4. Designing a Windows 7 Client Deployment
5. Designing 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 (if required)

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   Install Windows XP Professional

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   Designing 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   Designing Client Configurations

The learner can:

1. Design standard system settings
2. Define client security standards
3. Define Windows Internet Explorer settings

Outcome 4   Designing 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   Designing Application Packages for Deployment

The learner can:

1. Design a delivery or deployment strategy
2. Manage application compatibility

Unit 4520-345 Microsoft SQL Server 2005 - Implementation and Maintenance

Level: 3
Credit value: 13
UAN: H/502/3581

Learning outcomes

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

1. Install and Configure SQL Server 2005
2. Implement High Availability and Disaster Recovery
3. Support Data Consumers
4. Maintain Databases
5. Monitor and Troubleshoot SQL Server Performance
6. 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 (if required)

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   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   Implement High Availability and Disaster Recovery

The learner can:

1. Implement database mirroring
2. Implement log shipping
3. Manage database snapshots

Outcome 3   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   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   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   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

Unit 4520-346 Configuring Windows Server 2008 Active Directory

Level: **3**
Credit value: **13**
UAN: **M/502/3650**

Learning outcomes

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

1. Configure Domain Name System (DNS) for Active Directory
2. Configure the Active Directory infrastructure
3. Configure additional Active Directory server roles
4. Create and maintain Active Directory objects
5. Maintain the Active Directory environment
6. 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 (if required)

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　　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　　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　　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　　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   Maintain the Active Directory environment

The learner can:

1. Configure backup and recovery
2. Perform offline maintenance
3. Monitor Active Directory

Outcome 6   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

Unit 4520-347   Configuring Windows Server 2008 Network Infrastructure

Level: 3
Credit value: 11
UAN: J/502/3640

Learning outcomes

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

1. Configure IP Addressing and Services
2. Configure Name Resolution
3. Configure Network Access
4. Configuring File and Print Services
5. 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 (if required)

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   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   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   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   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   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

Unit 4520-348   Configuring Windows Server 2008 Applications Infrastructure

Level: **3**
Credit value: **13**
UAN: **L/502/3638**

Learning outcomes

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

1. Deploy Servers
2. Configure Terminal Services
3. Configure a Web Services Infrastructure
4. 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 (if required)

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

Learning outcomes

Outcome 1   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   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   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   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 e-mail integration

Unit 4520-349   Windows Server 2008, Server Administrator

Level: **3**
Credit value: **11**
UAN: **J/502/3637**

Learning outcomes

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

1. Plan for Server Deployment
2. Plan for Server Management
3. Monitor and Maintain Servers
4. Plan Application and Data Provisioning
5. 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 (if required)

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   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   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   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   Plan Application and Data Provisioning

The learner can:

1. Provision applications
2. Provision data

Outcome 5   Plan for Business Continuity and High Availability

The learner can:

1. Plan storage
2. Plan high availability
3. Plan for backup and recovery

Unit 4520-350   Windows Server 2008, Enterprise Administrator

Level: 3
Credit value: 14
UAN: T/502/3634

Learning outcomes

There are **four** learning outcomes to this unit. The learner will be able to:
1. Plan network and application services
2. Design core identity and access management components
3. Design support identity and access management components
4. 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 (if required)

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   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   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   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   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

Unit 4520-351   Implementing and Maintaining Microsoft SQL Server 2008

Level: **3**
Credit value: **10**
UAN: **J/600/4287**

Learning outcomes

There are **eight** learning outcomes to this unit. The learner will be able to:

1. Install and Configure SQL Server 2008
2. Maintain SQL Server Instances
3. Manage SQL Server Security
4. Maintain a SQL Server Database
5. Perform Data Management Tasks
6. Monitor and Troubleshoot SQL Server
7. Optimize SQL Server Performance
8. 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 (if required)

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   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   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   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   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   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   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   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   Implement High Availability

The learner can:

1. Implement database mirroring
2. Implement a SQL Server clustered instance
3. Implement log shipping
4. Implement replication

Unit 4520-371   Imaging Software

Level: 3
Credit value: 5
UAN: R/502/4614

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:
1. Obtain, insert and combine information for images
2. 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 (if required)

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   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   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

Unit 4520-372   Database Software

Level: 3
Credit value: 6
UAN: T/502/4556

Learning outcomes

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

1.   Plan, create and modify relational database tables to meet requirements
2.   Enter, edit and organise structured information in a databases
3.   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 (if required)

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　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　Enter, edit and organise structured information in a database

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　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

Unit 4520-373   Using Email

Level: 3
Credit value: 3
UAN: T/502/4301

Learning outcomes

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

1. Use e-mail software tools and techniques to compose and send messages
2. Manage use of e-mail 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 (if required)

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   Use e-mail software tools and techniques to compose and send messages

The learner can:

1. Select and use software tools to compose and format e-mail messages, including attachments
2. Explain methods to improve message transmission
3. Send e-mail messages to individuals and groups
4. Explain why and how to stay safe and respect others when using e-mail
5. Use an address book to manage contact information

Outcome 2   Manage use of e-mail software effectively

The learner can:

1. Develop and communicate guidelines and procedures for using e-mail effectively
2. Read and respond appropriately to e-mail 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 e-mail messages effectively
6. Customise e-mail software to make it easier to use
7. Explain how to minimise e-mail problems
8. Respond appropriately to email problems

Unit 4520-374   Using the Internet

Level: 3
Credit value: 5
UAN: **F/502/4298**

Learning outcomes

There are **five** learning outcomes to this unit. The learner will be able to:
1. Select and set up an appropriate connection to access the Internet
2. Set up and use browser software to navigate webpages
3. Use browser tools to search effectively and efficiently for information from the Internet
4. Use browser software to communicate information online
5. 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 (if required)

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 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 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 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 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   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

Unit 4520-375　　Presentation Software

Level:　　　　3
Credit value:　6
UAN:　　　　T/502/4623

Learning outcomes

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

1. Input and combine text and other information within presentation slides
2. Use presentation software tools to structure, edit and format presentations
3. 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 (if required)

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   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   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   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

Unit 4520-376 Spreadsheet Software

Level: 3
Credit value: 6
UAN: J/502/4626

Learning outcomes

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

1. Use a spreadsheet to enter, edit and organise numerical and other data
2. Select and use appropriate formulas and data analysis tools and techniques to meet requirements
3. 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 (if required)

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   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   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   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

Unit 4520-377   Website Software

Level: 3
Credit value: 5
UAN: **Y/502/4632**

Learning outcomes

There are **three** learning outcomes to this unit. The learner will be able to:
1. Create structures and styles and use them to produce websites
2. Select and use website software tools and features to develop multiple page websites with multimedia and interactive features
3. 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 (if required)

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   Select and use appropriate formulas and data analysis tools and   techniques to meet requirements

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   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

Unit 4520-378   Word Processing Software

Level: 3
Credit value: 6
UAN: Y/502/4629

Learning outcomes

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

1. Enter and combine text and other information accurately within word processing documents
2. Create and modify appropriate layouts, structures and styles for word processing documents
3. 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 (if required)

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   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   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   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

Unit 4520-379   Desktop Publishing Software

Level: 3
Credit value: 5
UAN: H/502/4567

Learning outcomes

There are **three** learning outcomes to this unit. The learner will be able to:
1. Select and use appropriate designs and page layouts for publications
2. Input and combine text and other information within publications
3. 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 (if required)

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   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   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   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

Unit 4520-380   Design Software

Level: 3
Credit value: 5
UAN: A/502/4574

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:
1. Obtain, insert and combine information for designs
2. 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 (if required)

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 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 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

Unit 4520-381   Cisco Passport21 Aspire

Level: 3
Credit value: 10
UAN: F/502/8982

Learning outcomes
There are **two** learning outcomes to this unit. The learner will be able to:
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 (if required)
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 businesss

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 and 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

Unit 4520-382   Cisco Voice

Level: **3**
Credit value: **10**
UAN: **Y/502/8972**

Learning outcomes

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

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 (if required)

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

Unit 4520-383   Cisco Passport 21 Entrepreneurship

Level: 3
Credit value: 20
UAN: H/502/8991

Learning outcomes

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

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 (if required)

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

Unit 4520-384   Cisco Passport 21 Entrepreneurship

Level: 3
Credit value: 10
UAN: L/502/8984

Learning outcomes

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

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 (if required)

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 Entrepreneurship

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

Unit 4520-385   Cisco Security

Level: 3
Credit value: 10
UAN: R/502/897

Learning outcomes

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

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 (if required)

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   Business Be able to maintain a secure network infrastructure

The learner can:

1. Administer effective security policies

Unit 4520-389   CIW JavaScript Specialist

Level: 3
Credit value: 10
UAN: Y/502/9006

Learning outcomes

There are **four** learning outcomes to this unit. The learner will be able to:
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 (if required)

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

Unit 4520-390   CIW database design

Level: 3
Credit value: 10
UAN: R/502/9005

Learning outcomes

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

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 (if required)

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   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   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   Implement Relational Algebra

The learner can:

1. Design relational algebra to improve database design
2. Implement joins in a database

Outcome 6   Manage database transactions and security

The learner can:

1. Develop transactions and currency control
2. Manage database security elements

Unit 4520-391 CIW Internet Business Foundations

Level: 3
Credit value: 10
UAN: D/502/9007

Learning outcomes

There are **four** learning outcomes to this unit. The learner will be able to:
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 (if required)

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

Unit 4520-392 CIW Perl Fundamentals

Level:	3
Credit value:	10
UAN:	M/502/9013

Learning outcomes

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

1. Understand PERL Principles
2. Manipulate data using Perl
3. 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 (if required)

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   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   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

Unit 4520-393   CIW Web Foundations Associate

Level:	**3**
Credit value:	**30**
UAN:	**T/502/9014**

Learning outcomes

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

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 (if required)

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

Unit 4520-394 CIW Site Development Foundations

Level: **3**
Credit value: **10**
UAN: **D/502/9010**

Learning outcomes

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

1. Create a web page
2. Understand web site enhancements
3. 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 (if required)

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 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 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

Unit 4520-395   CIW Network Technology Foundations

Level: 3
Credit value: 10
UAN: K/502/9009

Learning outcomes

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

1. Implement network communication principles
2. 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 (if required)

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   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   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

Unit 4520-396   CIW Security Essentials

Level: 3
Credit value: 10
UAN: R/502/9019

Learning outcomes

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

1. Understand network security principles
2. Understand encryption
3. Implement network security
4. Protect a networked environment
5. Understand Firewall Solutions
6. 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 (if required)

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   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   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 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

Unit 4520-397   Linux Professional Institute 201

Level: 3
Credit value: 10
UAN: R/502/8968

Learning outcomes

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

1. Understand core elements of the Linux Kernel
2. Manage system start-up
3. Manage the linux file system and devices
4. Manage the advanced storage device administration
5. Manage linux networking configuration
6. Support system maintenance
7. Implement an 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 (if required)

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:

1. Identify Kernel Components
2. Compile a Kernel
3. Patch a Kernel
4. Customise, build and install a custom kernel and kernel modules
5. Manage/Query kernel and kernel modules at runtime

Outcome 2　Manage system start-up

The learner can:

1. Customise system startup and boot processes
2. Manage System recovery

Outcome 3　Manage the linux file system and devices

The learner can:

1. Manage the Linux filesystem
2. Maintain a Linux filesystem
3. Implement udev Device Management
4. Creating and configuring filesystem options

Outcome 4　Manage the advanced storage device administration

The learner can:

1. Configure RAID
2. Manage Storage Device Access
3. Manage the Logical Volume Manager

Outcome 5　Manage linux networking configuration

The learner can:

1. Implement Basic networking configuration
2. Implement Advanced Network Configuration
3. Troubleshoot network issues
4. Support users on system-related issues

Outcome 6   Support system maintenance

The learner can:

1. Make and install programs from source
2. Support Backup operation

Outcome 7   Implement an linux domain name server

The learner can:

1. Implement Basic DNS server configuration
2. Create and maintain DNS zone
3. Secure a DNS server

Unit 4520-398   Linux Professional Institute 202

Level: **3**
Credit value: **10**
UAN: **L/502/8970**

Learning outcomes

There are **six** learning outcomes to this unit. The learner will be able to:
1. Manage Web Services
2. Manage File Sharing services
3. Manage Network Clients
4. Manage E-Mail Services
5. 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 (if required)

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   Manage Web Services

The learner can:

1. Implement a web server
2. Maintain a web server
3. Implement a proxy server

Outcome 2   Manage File Sharing services

The learner can:

1. Configure a SAMBA Server
2. Configure a NFS Server

Outcome 3   Manage Network Clients

The learner can:

1. Configure DHCP
2. Implement PAM authentication
3. Support LDAP client usage

Outcome 4   Manage E-Mail Services

The learner can:

1. Manage e-mail servers
2. Manage Local E-Mail Delivery
3. Manage Remote E-Mail Delivery

Outcome 5   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

Unit 4520-399   CompTIA and Linux Professional Institute Certification 102

Level: **3**
Credit value: **10**
UAN: **D/502/8973**

Learning outcomes

There are **six** learning outcomes to this unit. The learner will be able to:
1. Understand systems supporting 'Shells, Scripting and Data management'
2. Manage user interfaces and desktops
3. Manage Linux based Administrative Tasks
4. Manage Linux Essential System Services
5. Understand networking fundamentals
6. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Should be assessed using the approved CompTIA/Linux Professional Institute examination.

Unit 4520-399   CompTIA and Linux Professional Institute Certification 102

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   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   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   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　　Manage Linux based security

The learner can:

1. Perform security administration tasks
2. Configure host security
3. Secure data with encryption

Unit 4520-400   VM Ware Certified Professional

Level: **3**
Credit value: **20**
UAN: **J/502/8966**

Learning outcomes

There are **eight** learning outcomes to this unit. The learner will be able to:

1. Understand how to plan, install and upgrade VMware ESX/ESXi
2. Configure ESX/ESXi Networking
3. Configure ESX/ESXi Storage
4. Install and Configure vCenter Server
5. Deploy and Manage Virtual Machines and vApps
6. Manage vCenter Compliance
7. Establish vCenter Service Levels
8. 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 (if required)

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 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 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 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 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   Manage vCenter Compliance

The learner can:

1. Install, Configure and Manage VMware vCenter Update Manager
2. Establish and Apply ESX Host Profiles

Outcome 7   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   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

Unit 4520-404 Develop own effectiveness and professionalism

Level: 4
Credit value: 12
UAN: K/601/3502

Learning outcomes

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

1. Develop own personal and professional skills
2. 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. 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 (if required)

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 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 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   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

Unit 4520-405   Investigating and Defining Customer Requirements for ICT Systems

Level: 4
Credit value: 15
UAN: R/602/1772

Learning outcomes

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

1. Control the investigation of existing and proposed systems and processes
2. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-405   Investigating and Defining Customer Requirements for ICT Systems

Assessment Criteria

Outcome 1   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   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

Unit 4520-406   Remote Support for ICT Products or Services

Level: **4**
Credit value: **15**
UAN: **A/602/1264**

Learning outcomes

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

1. Understand the role of remote support in the organisation
2. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-406 Remote Support for ICT Products or Services

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 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

Unit 4520-407 Security of ICT Systems

Level: 4
Credit value: 15
UAN: H/500/7221

Learning outcomes

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

1. Understand the security threats to an IT system, their operational impact and the methods available to combat them
2. Maintain and improve ICT security procedures
3. 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 (if required)

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 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 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

Unit 4520-410   Technical Advice and Guidance

Level: 4
Credit value: 15
UAN: Y/500/7345

Learning outcomes

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

1. Control the provision of technical advice and guidance
2. Provide reactive technical advice and guidance to customers on a range of topics.
3. 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 (if required)

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   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 (e.g. manuals, handbooks, manufacturer's specifications)
    • information derived from the analysis of data (e.g. trend analysis, fault logs)
    • online information (e.g. manufacturer's websites, technical fora, discussion groups)
3. Describe the procedures and constraints which can apply to the provision of technical advice and guidance (e.g. 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 (e.g. to rectify known faults, to provide new functionality)

Outcome 2   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 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

Unit 4520-411   Technical fault diagnosis

Level: **4**
Credit value: **15**
UAN: **L/500/7391**

Learning outcomes

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

1. Understand the organisation's maintenance philosophy and the methods and information it requires
2. Maintain the diagnostic process and provide specialist support to others
3. Select and improve approaches to remedy for non-routine faults
4. 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 (if required)

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   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   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   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

Unit 4520-414   Working with ICT hardware and equipment

Level: **4**
Credit value: **15**
UAN: **T/500/7384**

Learning outcomes

There are **three** learning outcomes to this unit. The learner will be able to:
1. Understand how to manage working practices for ICT hardware and equipment
2. 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 (if required)

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   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

Unit 4520-416   Working with ICT hardware and equipment

Level: **4**
Credit value: **15**
UAN: **R/601/3297**

Learning outcomes

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

1. Understand the structure and uses of various data structures and their associated algorithms
2. Understand the operation of established algorithms
3. Select appropriate data structures and associated algorithms for specified problems
4. Describe the data structures and associated algorithms in a non-executable program specification language
5. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-416   Working with ICT hardware and equipment

Assessment Criteria

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   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   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   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

Unit 4520-420 Designing and developing event-driven computer programs

Level: **4**
Credit value: **15**
UAN: **J/601/3300**

Learning outcomes

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

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 (if required)

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

Learning outcomes

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 4520-421   Designing and developing procedural computer programs

Level: **4**
Credit value: **15**
UAN: **T/601/3311**

Learning outcomes

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

1. Design procedural programs to address loosely-defined problems
2. Produce a working procedural program which meets the design specification
3. Develop procedural programs that reflect established programming and software engineering practice
4. Develop test strategies and apply these to procedural 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 (if required)

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   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   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   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   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   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 4520-423 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 be able to:

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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-423   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 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 4520-426   Designing and developing a Web site

Level: 4
Credit value: 15
UAN: L/601/3315

Learning outcomes

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

1. Design a Web site to address loosely-defined requirements
2. 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. 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 (if required)

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 Web site
Assessment Criteria

Outcome 1　　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　　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　　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

Unit 4520-432   Cisco CCNP Route

Level: 4
Credit value: 10
UAN: F/601/9581

Learning outcomes

There are **eight** learning outcomes to this unit. The learner will be able to:

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 (if required)

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

Learning outcomes

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

Unit 4520-433   Cisco CCNP Switch

Level: **4**
Credit value: **10**
UAN: **J/601/9582**

Learning outcomes

There are **seven** learning outcomes to this unit. The learner will be able to:
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 (if required)

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

Learning outcomes

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

Unit 4520-434   Cisco CCNP Troubleshooting

Level: **4**
Credit value: **20**
UAN: **L/601/9583**

Learning outcomes

There are **nine** learning outcomes to this unit. The learner will be able to:

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 1**80** hours should be allocated for this unit.

Endorsement of the unit by a sector or other appropriate body (if required)

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
Learning outcomes

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:

1. Troubleshoot switch-to-switch connectivity
2. Troubleshoot Layer 2 forwarding problems
3. Troubleshoot spanning-tree configurations
4. Troubleshoot Layer 3 forwarding problems
5. 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:

1. Diagnose network layer connectivity problems using the IOS command line interface
2. Troubleshoot Layer 3 forwarding problems
3. Troubleshoot EIGRP problems
4. Troubleshoot OSPF problems
5. Troubleshoot route redistribution problems
6. Troubleshoot BGP problems

Outcome 6   Be able to Maintain and Troubleshoot Addressing Services

The learner can:

1. Troubleshoot a DHCP client and server solution
2. Troubleshoot NAT/PAT configurations

Outcome 7   Be able to Maintain and Troubleshoot Network Performance Issues on converged

The learner can:

1. Troubleshoot Layer 2 forwarding problems
2. Troubleshoot network implementations for wireless, VoIP and video solutions

Outcome 8   Be able to Maintain and Troubleshoot Network Security Implementations

The learner can:

1. Describe security features commonly implemented in complex networks and how those features affect the troubleshooting process
2. Troubleshoot AAA implementation
3. Troubleshoot ACLs and firewall implementations
4. Troubleshoot switch security implementation
5. Troubleshoot security issues related to IOS services and device hardening
6. Troubleshoot private VLANs
7. 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:

1. Diagnose and resolve problems in integrated, complex enterprise networks

Unit 4520-435   CIW E-commerce Designer

Level: **4**
Credit value: **20**
UAN: **M/502/8993**

Learning outcomes

There are **three** learning outcomes to this unit. The learner will be able to:
1. Host a functional e-commerce site
2. Support supplier transactions
3. 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 (if required)

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   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   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

Unit 4520-436   CIW Certified Internet Web Professional

Level: **4**
Credit value: **40**
UAN: **F/502/8996**

Learning outcomes

There are **seven** learning outcomes to this unit. The learner will be able to:
1. Host a functional e-commerce site
2. Support supplier transactions
3. Understand legal and ethical marketing
4. Manage the elements of a web site4.1
5. Evaluate a web site
6. Enhance a web site structure
7. 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 (if required)

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   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   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   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   Evaluate a web site

The learner can:

1.   Implement site design and layout techniques
2.   Critically review site design and usability

Outcome 6   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   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

Unit 4520-437   CIW Web Design Specialist

Level: **4**
Credit value: **20**
UAN: **L/502/8998**

Learning outcomes

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

1. Manage the elements of a web site
2. Evaluate a web site
3. Enhance a web site structure
4. 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 (if required)

This unit is endorsed by e-skills UK.

How is this unit assessed?

To be assessed using approved CIW examinations.

2
3
4

Unit 4520-437 CIW Web Design Specialist

Assessment Criteria

Outcome 1 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 Evaluate a web site

The learner can:

1. Implement site design and layout techniques
2. Critically review site design and usability

Outcome 3 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 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

Appendix 1   Glossary

Agree	to reach a joint decision (with one or more person(s))
Analyse	to study or examine a topic in detail, in order to discover more about it
Annotation	words/notes written on material (eg photographs or text) usually to personalise or clarify the material
Assessor observation	written evidence produced by the assessor to record what they have observed the learner doing
Attitude	the way a person views something (NB learners do not have to distinguish between skills, qualities and attitudes)
Learner portfolio	see 'portfolio'
Learner statement	information provided by the learner which can be hand written, typed or presented as a video or audio recording
Choose	select from a number of alternatives
Decide	reach a decision eg by considering options (these options may be suggested by the learner or another person)
Define	say (orally or in writing) what the meaning of something, especially a word, is (eg defining a particular term)
Demonstrate	show how something should be done. This is evidence of performance.
Describe	give details, to say or write what someone or something is like
Evaluate	to judge or calculate the quality, importance, amount or value of something
Explain	to make something clear or easy to understand by describing or giving information about it
Identify	to recognise something (or someone) and say (or prove) what (or who) they are
List	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.
Outline	give a general explanation or description without detail

Portfolio	a collection of evidence which meets the assessment criteria. This can be paper based and/or stored electronically (ie e-portfolio).
Qualities	distinguishing characteristics or attributes; a feature of personality (NB learners do not have to distinguish between skills, qualities and attitudes)
Range	at least three
Research	find information eg from a variety of oral and/or written sources
Skill	special ability or expertise, often acquired through training (NB learners do not have to distinguish between skills, qualities and attitudes)
State	can be written or oral evidence. Evidence for oral contribution could be an assessor record of questioning.
UAN	Unit accreditation number
Use	to put something such as a tool or skill to a particular purpose
Witness statement	written evidence produced by someone other than the assessor to record what they have observed the learner doing

Useful contacts

Type	Contact	Query
UK learners	T: +44 (0)20 7294 2800 E: learnersupport@cityandguilds.com	• General qualification information
International learners	T: +44 (0)20 7294 2885 F: +44 (0)20 7294 2413 E: intcg@cityandguilds.com	• General qualification information
Centres	T: +44 (0)20 7294 2787 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com	• Exam entries • Registrations/enrolment • Certificates • Invoices • Missing or late exam materials • Nominal roll reports • Results
Single subject qualifications	T: +44 (0)20 7294 8080 F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) E: singlesubjects@cityandguilds.com	• Exam entries • Results • Certification • Missing or late exam materials • Incorrect exam papers • Forms request (BB, results entry) • Exam date and time change
International awards	T: +44 (0)20 7294 2885 F: +44 (0)20 7294 2413 E: intops@cityandguilds.com	• Results • Entries • Enrolments • Invoices • Missing or late exam materials • Nominal roll reports
Walled Garden	T: +44 (0)20 7294 2840 F: +44 (0)20 7294 2405 E: walledgarden@cityandguilds.com	• Re-issue of password or username • Technical problems • Entries • Results • GOLA • Navigation • User/menu option problems
Employer	T: +44 (0)121 503 8993 E: business_unit@cityandguilds.com	• Employer solutions • Mapping • Accreditation • Development Skills • Consultancy
Publications	T: +44 (0)20 7294 2850 F: +44 (0)20 7294 3387	• Logbooks • Centre documents • Forms • Free literature

If you have a complaint, or any suggestions for improvement about any of the services that City & Guilds provides, email: **feedbackandcomplaints@cityandguilds.com**

EN127546