City & Guilds Diplomas in ICT Professional Competence (4520-02/03/04)

Levels 1–4 Unit Handbook for Centres
(Units 400–580)

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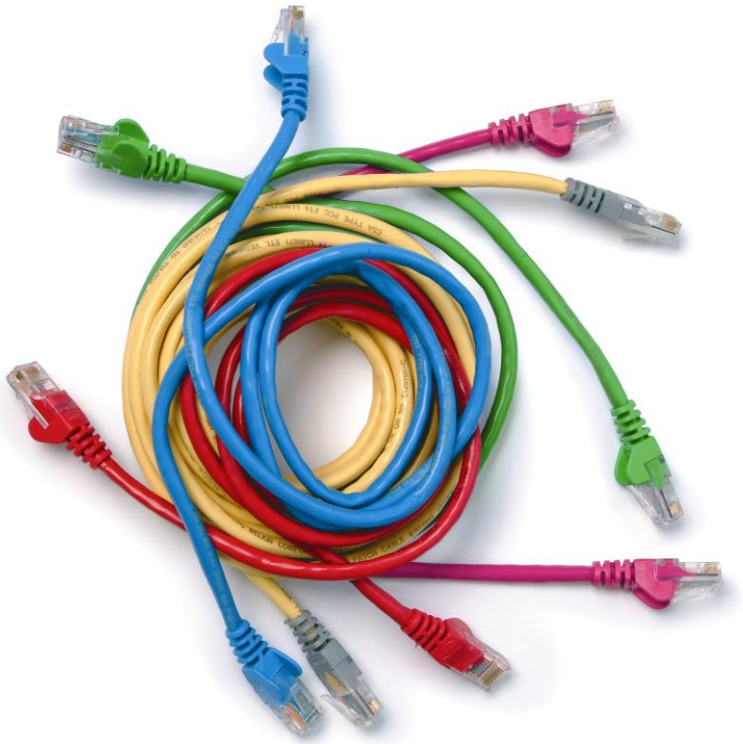

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City & Guilds Diplomas in ICT Professional Competence (4520-02/03/04)

Levels 1–4 Unit Handbook for Centres
(Units 400–580)

Qualification title	Number	Ofqual number
City & Guilds Level 2 Diploma in ICT Professional Competence	4520-02	501/1789/0
City & Guilds Level 3 Diploma in ICT Professional Competence	4520-03	501/1788/9
City & Guilds Level 4 Diploma in ICT Professional Competence	4520-04	501/1787/7

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Contents

1 Introduction to this unit handbook

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

Qualification title	Number	Ofqual number
City & Guilds Level 2 Diploma in ICT Professional Competence	4520-02	501/1789/0
City & Guilds Level 3 Diploma in ICT Professional Competence	4520-03	501/1788/9
City & Guilds Level 4 Diploma in ICT Professional Competence	4520-04	501/1787/7

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

The unit handbook should be read in conjunction with the *City & Guilds Diploma in ICT Professional Competence Qualification Handbook* (4520-02, 4520-03, 4520-04), containing 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
- learning outcomes
- statement of guided learning hours
- how the unit is assessed
- and assessment criteria.

Guidance for centres

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

When first developed, units 439–451, 453, 501–504 and 580 were endorsed by e-skills UK.

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.

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 4520-404 Develop own effectiveness and professionalism

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

Unit aim

The aim of this unit is to encourage the learner to reflect on themselves, their skills and where they fit within an organisation. In order to do this the learner will have an opportunity to identify their own development needs by, not only looking at themselves, but asking others to look at them. The learner will also manage their own development and reflect critically on their own learning. They will learn to effectively manage their own and others time and identify obstacles for effective teamwork. The learner will learn to understand what is meant by professional practice as well as learning about any ethical and legislative issues that affect their working environment. Lastly the learner will have an opportunity to look at how they might be able to improve on organisational effectiveness, by looking at any improvements to working practices that could be made.

Learning outcomes

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

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

Guided learning hours

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

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-404 Develop own effectiveness and professionalism

Assessment Criteria

Outcome 1 Be able to develop own personal and professional skills

The learner can:

1. identify own development needs and the activities needed to meet them
2. obtain and interpret feedback from others on performance
3. set and agree personal goals and participate in development activities to meet them
4. manage own personal/professional development in order to achieve career and personal goals
5. reflect critically on own learning

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

The learner can:

1. effectively plan and manage own and others time
2. recognise and respect diversity, individual differences and perspectives
3. accept and provide feedback in a constructive and considerate manner
4. understand the responsibilities, interests and concerns of colleagues
5. understand the role of the individual and teams in an IT organisation
6. identify and resolve obstacles to effective teamwork

Outcome 3 Understand what is meant by professional practice

The learner can:

1. Interpret the implications, and applicability for IT professionals of:
    - Data Protection Act
    - Computer Misuse Act
2. Describe the role of professional bodies for IT, and the benefits of membership to individuals and organisations
3. Explain the importance of quality management systems and standards for systems development

Outcome 4 Understand the ethical and legislative environment relating to IT activities

The learner can:

1. Describe the types of conflicts of interest which can arise for IT professionals
2. Evaluate the impact on an IT organisation of legislation covering:
    - Processing of financial transactions
    - Health and Safety
    - Privacy, Confidentiality and Security
    - Copyright and Intellectual Property Rights

Outcome 5 Be able to improve organisational effectiveness

The learner can:

1. Interpret the aims and objectives of the organisation
2. Describe the organisation's brand or image and how it can be promoted
3. Describe the organisation's structure, roles and responsibilities
4. Identify and evaluate potential improvements to organisational effectiveness

Unit 4520-405 Investigating and defining customer requirements for ICT systems

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

Unit aim

The aim of this unit is to teach the learner how to investigate and define the requirements of their customers when looking at ICT systems. In order to do this the learner will learn how to use different methods of investigating the requirements of their customers, they will also learn how to record their findings and present them to colleagues. The learners will learn to analyse information and identify the needs and constraints in meeting the requirements of their customers.

Learning outcomes

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

1. Be able to control the investigation of existing and proposed systems and processes
2. Be able to analyse information to identify needs and constraints

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

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 Be able to control the investigation of existing and proposed systems and processes

The learner can:

1. Select and use the investigative methods which will elicit relevant information about existing and proposed systems and processes
2. Create the documentation required to record the results of investigations
3. Ensure that investigative methods are applied correctly and all relevant information is recorded using standard documentation
4. Ensure that the confidentiality of customer information is preserved
5. Provide advice and guidance to colleagues on investigation and analysis of information

Outcome 2 Be able to analyse information to identify needs and constraints

The learner can:

1. Explain the types of defect, and their causes which can arise in information
2. Describe methods of minimising defects in information
3. Explain how customer needs and constraints can affect the design of an ICT system
4. Analyse information to identify customer needs and priorities for:
    - data to be stored and processed
    - functionality in terms of inputs, processes and outputs
    - capacity including numbers of users, throughput, and data storage
5. Analyse information to identify customer constraints
6. Verify that identified needs, priorities and constraints meet customer requirements

Unit 4520-406 Remote support for ICT products or services

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

Unit aim

The aim of this unit is to provide the learner with the necessary skills that will enable them to provide remote support for ICT products or services. In order to do this the learner will learn to understand the role of remote support within an organisation by understanding the types of ICT products and services that can be supported. Learners will also maintain and support customer requirements whilst ensuring compliance with any organisational requirements that there may be.

Learning outcomes

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

1. Understand the role of remote support in the organisation
2. Be able to maintain and implement customer support requirements

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

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 Be able to maintain and implement customer support requirements

The learner can:

1. Review and update organisational requirements for customer support
2. Handle complaints from high risk or high profile customer issues
3. Provide suggestions to prevent future reoccurrence of complaints
4. Ensure compliance with organisational requirements
5. Initiate suitable actions to deal with deficiencies in customer support provision
6. Schedule audits of working practices and work monitoring
7. Suggest improvements to the quality and efficiency of remote support operations

Unit 4520-407 Security of ICT systems

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

Unit aim

The aim of this unit is to teach the learner how to understand the security threats to an IT system and the operational impact to these threats on an organisation. In order to do this the learner will learn the different protection methods for data and physical systems and they will learn to implement and maintain policies and procedures that will protect both data and physical systems from attack.

Learning outcomes

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

1. Understand the security threats to an IT system, their operational impact and the methods available to combat them
2. Be able to maintain and improve ICT security procedures
3. Be able to implement security procedures

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-407 Security of ICT systems

Assessment Criteria

Outcome 1 Understand the security threats to an IT system, their operational impact and the methods available to combat them

The learner can:

1. Describe the data protection methods that are relevant to the organisation
2. Describe physical security methods in use
3. Describe organisational security procedures
4. Describe types of possible security breaches and their operational impacts

Outcome 2 Be able to maintain and improve ICT security procedures

The learner can:

1. Review and update security procedures
2. Ensure compliance with security procedures by scheduling security audits
3. Initiate suitable actions to deal with identified breaches of security
4. Inform colleagues of their security responsibilities and confirm their understanding at suitable intervals

Outcome 3 Be able to implement security procedures

The learner can:

1. Schedule and carry out security risk assessments
2. Select appropriate security tools for the organisation or department to use

Unit 4520-410 Technical advice and guidance

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

Unit aim

The aim of this unit is to teach the learner how to provide and manage technical advice and guidance. In order to this the learner will learn how to control the provision of technical support and guidance, by ensuring that policies and procedures are in place and being followed. The learner will also learn the importance of providing proactive and reactive support to users.

Learning outcomes

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

1. Be able to control the provision of technical advice and guidance
2. Be able to provide reactive technical advice and guidance to customers on a range of topics.
3. Be able to provide proactive technical advice and guidance to customers

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-410 Technical advice and guidance

Assessment Criteria

Outcome 1 Be able to control the provision of technical advice and guidance

The learner can:

1. Ensure that organisational procedures for providing technical advice and guidance are followed.
    - resolve problems
    - improve performance
2. Describe the types, sources and applicability of information which can form the basis of technical advice and guidance:
    - information from reference sources (eg manuals, handbooks, manufacturer's specifications)
    - information derived from the analysis of data (eg trend analysis, fault logs)
    - online information (eg manufacturer's websites, technical fora, discussion groups)
3. Describe the procedures and constraints which can apply to the provision of technical advice and guidance (eg escalation, commercial/contractual, legal/regulatory, information security)
4. Identify circumstances where technical advice and guidance should be provided proactively rather than reactively in response to customer requests (eg to rectify known faults, to provide new functionality)

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

The learner can:

1. Determine the purposes for which technical advice and guidance is required
2. Verify that customers are entitled to receive the requested technical advice and guidance
3. Communicate effectively with customers to elicit sufficient information to enable correct technical advice and guidance to be provided
4. Source and interpret relevant technical information to produce advice and guidance in response to customer requests
5. Communicate technical advice and guidance to customers in a format and style which meets their needs, confirming customer understanding of the information provided
6. Follow organisational procedures for responding to customer requests including the timely escalation of those for which technical advice and guidance cannot be provided or does not resolve the request

Outcome 3 Be able to provide proactive technical advice and guidance to customers

The learner can:

1. Identify the purposes for which the technical advice and guidance is required
2. Identify the customers, and their level of technical knowledge, to whom the technical advice and guidance should be provided
3. Develop technical advice and guidance in a format and style which takes into account the customers' level of technical knowledge
4. Follow organisational procedures for providing proactive technical advice and guidance

Unit 4520-411 Technical fault diagnosis

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

Unit aim

The aim of this unit is to teach the learner how to provide and manage technical fault diagnosis. In order to do this the learner will learn the maintenance philosophy and processes used by an organisation. They will also learn how to interpret technical information from a range of sources and products. The learner will learn how to maintain and manage the diagnostic process and provide specialist support, as well as selecting and improving approaches to providing support. The learner will be able to implement processes required to maintain technical fault diagnosis.

Learning outcomes

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

1. Understand the organisation's maintenance philosophy and the methods and information it requires
2. Be able to maintain the diagnostic process and provide specialist support to others
3. Be able to select and improve approaches to remedy for non-routine faults
4. Be able to implement processes for diagnosis and remedy records

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-411 Technical fault diagnosis

Assessment Criteria

Outcome 1 Understand the organisation's maintenance philosophy and the methods and information it requires

The learner can:

1. Describe the maintenance philosophy and processes used by the organisation
2. Explain the types of diagnostic information that are commonly needed:
    - problem description
    - problem history
    - problem location
    - technical information on a specified range of products including the system under investigation
3. Explain the following diagnostic methods and give examples of their appropriate use:
    - substitution
    - replication
    - performance and functional testing
    - environment change
4. Explain how the following considerations can affect fault diagnosis.
    - minimisation of service disruption during diagnostics
    - individual responsibility and authority
    - escalation procedure
    - service level agreements
5. Interpret specialist technical information on a range of products

Outcome 2 Be able to maintain the diagnostic process and provide specialist support to others

The learner can:

1. Develop diagnostic tools
2. Review and specify approved sources of diagnostic information
3. Review and specify documentation and other recording systems to support diagnosis
4. Analyse information across a wide range of faults to identify common issues
5. Review and specify processes for identifying issues such as:
    - poor product design
    - poor manufacture
    - poor performance
    - poor implementation
    - high rates of failure
6. Provide specialist guidance to support diagnosis

Outcome 3 Be able to select and improve approaches to remedy for non-routine faults

The learner can:

1. Review and specify suitable remedies to rectify identified faults taking into account the following:
    - business or service impact
    - resource and skill availability
    - ease of implementation
    - cost effectiveness
    - performance
    - compatibility
    - time
    - permanence
2. Identify possible ways to prevent reoccurrence of diagnosed faults

Outcome 4 Be able to implement processes for diagnosis and remedy records

The learner can:

1. Implement approaches to documenting the diagnosis activities undertaken including:
    - fault description
    - supporting information
    - diagnostic tools etc used
    - cause of fault
    - remedy selected

Unit 4520-414 Working with ICT hardware and equipment

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

Unit aim

The aim of this unit is to teach the learner how to work with different forms of ICT hardware and equipment. In order to this the learner will learn how to manage working practices for different ICT hardware and equipment. They will also manage and improve working practices relating to ICT hardware and equipment.

Learning outcomes

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

1. Understand how to manage working practices for ICT hardware and equipment
2. Be able to manage and improve working practices relating to ICT hardware and equipment
3. Be able to improve working practices to minimise risk to the organisation

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-414 Working with ICT hardware and equipment

Assessment Criteria

Outcome 1 Understand how to manage working practices for ICT hardware and equipment

The learner can:

1. Explain how to align processes with organisational objectives and customer needs
2. Explain the appropriate uses of tools and techniques
3. Explain which regulatory requirements might affect working procedures and how to take them into account

Outcome 2 Be able to manage and improve working practices relating to ICT hardware and equipment

The learner can:

1. Select, adapt and use relevant tools and techniques safely
2. Create and implement working procedures relating to the use of ICT hardware and equipment
3. Obtain and allocate required materials
4. Record relevant information
5. Communicate the progress and outcome of work to the appropriate people
6. Develop documentation to support effective working practices
7. Develop tools to enable more efficient working practices
8. Contribute to the development of the organisation's work strategy

Outcome 3 Be able to improve working practices to minimise risk to the organisation

The learner can:

1. Improve working practices in order to assess and minimise risks

Unit 4520-416 Data structures and algorithms

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

Unit aim

The aim of this unit is to teach the learner the importance of data structures and algorithms associated with data. In order to do this the learner will learn to define the terminology used and describe the elements of data structures. They will also learn to understand the operation of established algorithms and learn how to describe and implement data structures in algorithms in non-executable and executable programs.

Learning outcomes

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

1. Understand the structure and uses of various data structures and their associated algorithms
2. Understand the operation of established algorithms
3. Be able to select appropriate data structures and associated algorithms for specified problems
4. Be able to describe the data structures and associated algorithms in a non-executable program specification language
5. Be able to implement data structures and algorithms in an executable programming language
6. Understand how strings are structured and processed

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-416 Data structures and algorithmsData structures and algorithms

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 Be able to select appropriate data structures and associated algorithms for specified problems

The learner can:

1. Given a specified problem, choose a data structure and associated algorithm and justify the selection

Outcome 4 Be able to describe the data structures and associated algorithms in a non-executable program specification language

The learner can:

1. Specify the structure and associated algorithms of arrays, linked lists, stacks, queues, trees, graphs and sets in well-established specification languages
2. Specify the behaviour of sorting, searching and recursive algorithms using well-established specification languages
3. Demonstrate the operation of data-structures and algorithms by hand execution of the associated algorithms with specified test data

Outcome 5 Be able to implement data structures and algorithms in an executable programming language

The learner can:

1. Implement arrays, linked lists, stacks, queues, trees, graphs and sets in the context of well-defined problems in an executable programming language
2. Implement sorting, searching and recursive algorithms in the context of well-defined problems in an executable programming language

3. Demonstrate the correct operation of data structure algorithms implemented in an executable programming language by devising and executing testing strategies

Outcome 6 Understand how strings are structured and processed

The learner can:

1. Explain the structure of strings
2. Identify common string operations
3. Demonstrate the outcome of string operations on specified strings

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

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

Unit aim

The aim of this unit is to teach the concepts of event driven programming. In order to do this the learner will learn some of the features of an event driven environment such as using standard input and output commands and use the integrated development environment effectively. They will have an opportunity to use what they have learnt by modifying an existing program to improve its quality. The learner will test their amended cost against actual and expected outcomes. Lastly the learner will develop design documentation for use in program maintenance as well as end user documentation such as a user guide.

Learning outcomes

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

1. Be able to design event-driven programs to address loosely-defined problems
2. Be able to produce a working event-driven program which meets the design specification
3. Be able to develop event-driven programs that reflect established programming and software engineering practice
4. Be able to develop test strategies and apply these to event-driven programs
5. Be able to develop design documentation for use in program maintenance and end-user documentation

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

How is this unit assessed?

Assessment is by a learner portfolio.

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

Assessment Criteria

Outcome 1 Be able to design event-driven programs to address loosely-defined problems

The learner can:

1. Identify and structure the components and data required to address problems
2. Select and use pre-defined components, specialising as required
3. Identify the set of events that invoke behaviour of components and other programme elements
4. Specify the behaviour of components and other program elements to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
5. Record the design using well-established notations

Outcome 2 Be able to produce a working event-driven program which meets the design specification

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

Outcome 3 Be able to develop event-driven programs that reflect established programming and software engineering practice

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

Outcome 4 Be able to develop test strategies and apply these to event-driven programs

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program

Outcome 5 Be able to develop design documentation for use in program maintenance and end-user documentation

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

Unit 4520-421 Designing and developing procedural computer programs

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

Unit aim

The aim of this unit is to teach the concepts of procedural programming. As part this unit the learner will learn some of the key elements of a procedural language such as how to declare file structures and how to use some of the predefined functions. They will have an opportunity to use what they have learnt by modifying an existing program to improve its quality. They will test the revised code and record expected and actual results. Lastly the learner will develop design documentation for use in program maintenance as well as end user documentation such as a user guide.

Learning outcomes

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

1. Be able to design procedural programs to address loosely-defined problems
2. Be able to produce a working procedural program which meets the design specification
3. Be able to develop procedural programs that reflect established programming and software engineering practice
4. Be able to develop test strategies and apply these to procedural programs
5. Be able to develop design documentation for use in program maintenance and end-user documentation

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-421 Designing and developing procedural computer programs

Assessment Criteria

Outcome 1 Be able to design procedural programs to address loosely-defined problems

The learner can:

1. Identify and structure procedures and functions to address problems
2. Select and use library functions and procedures
3. Structure the design with regard to coupling and cohesion
4. Specify the behaviour of functions and procedures to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
5. Record the design using well-established notations

Outcome 2 Be able to produce a working procedural program which meets the design specification

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

Outcome 3 Be able to develop procedural programs that reflect established programming and software engineering practice

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

Outcome 4 Be able to develop test strategies and apply these to procedural programs

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program

Outcome 5 Be able to develop design documentation for use in program maintenance and end-user documentation

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

Unit 4520-426 Designing and developing a website

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

Unit aim

The aim of this of this unit is to teach the learners how to design and develop professional websites. In order to do this the learner will learn how to design websites based on customer requirements. They will also learn to use development tools and design multimedia content for a website as well as developing test strategies and understanding the need to adhere to web standards when designing and implementing websites.

Learning outcomes

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

1. Be able to design a Web site to address loosely-defined requirements
2. Be able to use web development tools to build (X)HTML- and CSS-based websites to address well-defined specifications
3. Understand the technology and tools needed to use multimedia in the context of a website
4. Be able to develop test strategies and apply these to a Web site
5. Understand the need for Web standards
6. Understand the concepts associated with using the Internet and the World Wide Web for business

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by e-skills UK.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-426 Designing and developing a website

Assessment Criteria

Outcome 1 Be able to design procedural programs to address loosely-defined problems

The learner can:

1. Identify the key design features inherent within a requirements specification
2. Use planning tools and techniques to create a site map
3. Evaluate different design models and select the most appropriate to meet requirements

Outcome 2 Be able to produce a working procedural program which meets the design specification

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 Be able to develop procedural programs that reflect established programming and software engineering practice

The learner can:

1. Explain the advantages and disadvantages of various types of multimedia file format
2. Explain the advantages and disadvantages of different types of multimedia element in relation to different contexts
3. Embed functional multimedia components in an (X)HTML site

Outcome 4 Be able to develop test strategies and apply these to procedural programs

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 Be able to develop design documentation for use in program maintenance and end-user documentation

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 how strings are structured and processed

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 4520-438 Software applications testing

Level: **4**
Credit value: **15**
UAN: **L/601/1984**

Unit aim

The purpose of this unit is to provide learners with the principles of software application testing. Learners will develop their skills to test, implement and evaluate software applications prior to commercial deployment regardless of the software language being used.

Learning outcomes

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

1. Understand the principles of software application testing
2. Be able to design test strategies
3. Be able to implement test plans
4. Be able to evaluate test plans

Guided learning hours

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

How is this unit assessed?

The assessment for this unit is centre devised.

Unit 4520-438 Software applications testing

Assessment Criteria

Outcome 1 Understand the principles of software application testing

The learner can:

1. Evaluate testing techniques applicable to the testing opportunity
2. Compare the relative benefits of different testing methodologies
3. Justify a proposed testing methodology

Outcome 2 Be able to design test strategies

The learner can:

1. Design a test strategy for a given testing opportunity
2. Design a test plan for a given testing opportunity
3. Justify the test plan proposition and testing strategy

Outcome 3 Be able to implement test plans

The learner can:

1. **Implement a test plan** based on a given testing opportunity.

Range

Implement a test plan

Test plan

Test data

Test log

Reporting of malfunctions

Developers not to test own work

Outcome 4 Be able to evaluate test plans

The learner can:

1. Critically **review the test outcomes**
2. **Justify the validity of the test** and identify any potential issues

Range

Review the test outcomes

Testing report

Critical review of any failures

Analyse all test results

Comparison to design specification

End user/tester feedback

Peer reviews

Justify the validity of the test

Test results

Compare test used with alternatives

Maximised test coverage

Technical documentation

Recording changes resulting from testing

Unit 4520-439 Provide leadership and direction for own area of responsibility

Level: **4**
Credit value: **5**
UAN: **T/600/9601**

Unit aim
This unit helps learners to provide leadership and direction for their area of responsibility.

Learning outcomes
There are **four** learning outcomes to this unit. The learner will:
1. Be able to lead in own area of responsibility
2. Be able to provide direction and set objectives in own area of responsibility
3. Be able to communicate the direction for own area of responsibility and collect feedback to inform improvement
4. Be able to assess own leadership performance

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

How is this unit assessed?
This unit will be assessed by a portfolio of evidence.

Unit 4520-439 Provide leadership and direction for own area of responsibility

Assessment Criteria

Outcome 1 Be able to lead in own area of responsibility

The learner can:

1. Identify own strengths and ability to lead in a leadership role
2. Evaluate strengths within own area of responsibility.

Outcome 2 Be able to provide direction and set objectives in own area of responsibility

The learner can:

1. Outline direction for own area of responsibility
2. Implement objectives with colleagues that align with those of the organisation.

Outcome 3 Be able to communicate the direction for own area of responsibility and collect feedback to inform improvement

The learner can:

1. Communicate the agreed direction to individuals within own area of responsibility
2. Collect feedback to inform improvement.

Outcome 4 Be able to assess own leadership performance

The learner can:

1. Assess feedback on own leadership performance
2. Evaluate own leadership performance.

Unit 4520-440 Plan, allocate and monitor work in own area of responsibility

Level: **4**
Credit value: **5**
UAN: **H/600/9674**

Unit aim

This unit helps learners to plan, allocate and monitor work in own area of responsibility, and make any necessary changes to original work plans.

Learning outcomes

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

1. Be able to produce a work plan for own area of responsibility
2. Be able to allocate and agree responsibilities with team members
3. Be able to monitor the progress and quality of work in own area of responsibility and provide feedback
4. Be able to review and amend plans of work for own area of responsibility and communicate changes

Guided learning hours

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

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-440 Plan, allocate and monitor work in own area of responsibility

Assessment Criteria

Outcome 1 Be able to produce a work plan for own area of responsibility

The learner can:

1. Explain the context in which work is to be undertaken
2. Identify the skills base and the resources available
3. Examine priorities and success criteria needed for the team
4. Produce a work plan for own area of responsibility.

Outcome 2 Be able to allocate and agree responsibilities with team members

The learner can:

1. Identify team members' responsibilities for identified work activities
2. Agree responsibilities and SMART (Specific, Measurable, Achievable, Realistic and Time-bound) objectives with team members.

Outcome 3 Be able to monitor the progress and quality of work in own area of responsibility and provide feedback

The learner can:

1. Identify ways to monitor progress and quality of work
2. Monitor and evaluate progress against agreed standards and provide feedback to team members.

Outcome 4 Be able to review and amend plans of work for own area of responsibility and communicate changes

The learner can:

1. Review and amend work plan where changes are needed
2. Communicate changes to team members.

Unit 4520-441 Plan and manage a project

Level: **4**
Credit value: **8**
UAN: **J/600/9750**

Unit aim

This unit covers the skills and knowledge required to allow learners to manage projects they have been given responsibility for. This involves developing and agreeing a plan for the project and monitoring and controlling implementation of and changes to the plan. It also involves ensuring that the project achieves its key objectives and is completed to the satisfaction of the project sponsor(s) and any key stakeholders.

Learning outcomes

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

1. Understand the principles, processes, tools and techniques of project management
2. Be able to agree the scope and objectives of a project
3. Be able to identify the budget in order to develop a project plan
4. Be able to implement a project plan
5. Be able to manage a project to its conclusion

Guided learning hours

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

How is this unit assessed?

This unit is assessed by a portfolio of evidence.

Unit 4520-441 Plan and manage a project

Assessment Criteria

Outcome 1 Understand the principles, processes, tools and techniques of project management

The learner can:

1. Describe the roles and responsibilities of a project manager
2. Explain how to apply principles, processes, tools and techniques of project management

Outcome 2 Be able to agree the scope and objectives of a project

The learner can:

1. Agree SMART (Specific, Measurable, Achievable, Realistic, and Time-bound) objectives and scope of the project with project sponsor(s) and stakeholders

Outcome 3 identify the budget in order to develop a project plan

The learner can:

1. Identify budget and timescales in order to develop the project plan with stakeholders
2. Consult with stakeholders to negotiate the project plan
3. Identify potential risks and contingencies
4. Establish criteria and processes for evaluating the project on completion
5.

Outcome 4 Be able to manage a project to its conclusion

The learner can:

1. Allocate roles and responsibilities to project team members
2. Provide resources identified in the project plan
3. Brief project team members on the project plan and their roles and responsibilities
4. Implement a project plan using project management tools and techniques

Outcome 5 Be able to manage a project to its conclusion

The learner can:

1. Apply a range of project management tools and techniques to monitor, control and review progress
2. Provide support to project team members

Unit 4520-442 Prepare for and support quality audits

Level: **4**
Credit value: **4**
UAN: **Y/600/9798**

Unit aim

This unit allows learners to prepare for, and participate in, quality audits within their area of responsibility as part of a formal quality management system.

Learning outcomes

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

1. Understand the quality standards and procedures that apply to own area of responsibility
2. Be able to monitor work in own area of responsibility against quality standards and procedures
3. Be able to prepare for a quality audit in own area of responsibility
4. Be able to discuss quality audit findings with the auditor
5. Be able to complete agreed actions following a quality audit

Guided learning hours

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

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-442 Prepare for and support quality audits

Assessment Criteria

Outcome 1 Understand the quality standards and procedures that apply to own area of responsibility

The learner can:

1. Describe the quality standards and procedures that apply to own area of responsibility

Outcome 2 Be able to monitor work in own area of responsibility against quality standards and procedures

The learner can:

1. Select and apply methods for monitoring work

Outcome 3 Be able to prepare for a quality audit in own area of responsibility

The learner can:

1. Prepare and organise records and documentation for the quality auditor
2. Review previous quality audits and ensure agreed recommendations have been implemented

Outcome 4 Be able to complete agreed actions following a quality audit

The learner can:

1. Discuss with the auditor the results of the audit and identify any areas for improvement
2. Agree corrective actions to remedy any identified issues, and set a date for their implementation

Outcome 5 Be able to complete agreed actions following a quality audit

The learner can:

1. Take corrective action based on quality audit findings

Unit 4520-443 Manage a project

Level: **4**
Credit value: **7**
UAN: **R/506/1999**

Unit aim

This unit aims to develop the knowledge and skills required to manage a project. Upon completion of this unit, learners will have developed an understanding of the management of a project and will be able to plan, manage and evaluate a project.

Learning outcomes

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

1. Understand the management of a project
2. Be able to plan a project
3. Be able to manage a project
4. Be able to evaluate the effectiveness of a project

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **38** hours should be allocated for this unit.

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-443 Manage a project

Assessment Criteria

Outcome 1 Understand the management of a project

The learner can:

1. Explain how to carry out a cost-benefit analysis for a project
2. Evaluate the use of risk analysis techniques
3. Evaluate project planning and management tools and techniques
4. Evaluate the impact of changes to project scope, schedule, finance, risk, quality and resources
5. Analyse the requirements of project governance arrangements

Outcome 2 Be able to plan a project

The learner can:

1. Analyse how a project fits with an organisation's overall vision, objectives, plans and programmes of work
2. Agree the objectives and scope of proposed projects with stakeholders
3. Assess the interdependencies and potential risks within a project
4. Develop a project plan with specific, measurable, achievable, realistic and time-bound (SMART) objectives, key performance indicators (KPIs) and evaluations mechanisms appropriate to the plan
5. Develop proportionate and targeted plans to manage identified risks and contingencies
6. Apply project lifecycle approaches to the progress of a project

Outcome 3 Be able to manage a project

The learner can:

1. Allocate resources in accordance with the project plan
2. Brief project team members on their roles and responsibilities
3. Implement plans within agreed budgets and timescales
4. Communicate the requirements of the plans to those who will be affected
5. Revise plans in the light of changing circumstances in accordance with project objectives and identified risks
6. Keep stakeholders up to date with developments and problems
7. Complete close-out actions in accordance with project plans
8. Adhere to organisational policies and procedures, legal and ethical requirements when managing a project

Outcome 4 Be able to evaluate the effectiveness of a project

The learner can:

2. Conduct periodic reviews of the progress and effectiveness of a project using information from a range of sources
3. Evaluate the effectiveness of capturing and managing project-related knowledge
4. Report on the effectiveness of plans

Unit 4520-444 Carrying out information security risk assessment

Level: **4**
Credit value: **12**
UAN: **A/505/5792**

Unit aim

This unit aims to develop the knowledge and skills required to plan and undertake an information security risk assessment. Upon completion of this unit, learners will be able to interpret risk assessment briefs, identify the information required to allow them to plan and carry out an effective security risk assessment.

Learning outcomes

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

1. Be able to prepare for Information Security Risk Assessments
2. Be able to carry out Information Security Risk Assessments

Guided learning hours

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

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-444 Carrying out information security risk assessment

Unit 4520-444 Carrying out information security risk assessment

Assessment Criteria

Outcome 1 Be able to prepare for Information Security Risk Assessments

The learner can:

1. Interpret given risk assessment briefs to identify the information assets and system components to be assessed
2. Verify the scope of identified information assets and system components with relevant persons
3. Evaluate sources of information relating to potential risks that may impact on the security of identified information assets and system components

Outcome 2 Be able to carry out Information Security Risk Assessments

The learner can:

1. Use a range of investigative methods to gather information relating to potential risks that may impact on the security of identified information assets and system components
2. Record all gathered information in line with organisational requirements
3. Analyse gathered information to identify risks to the security of identified information assets and system components
4. Assess identified risks to determine their probability of occurrence and potential impact
5. Evaluate risks against organisational risk tolerance levels
6. Report any risks which exceed organisational risk tolerance levels to the relevant persons following organisational procedures and timelines
7. Formulate actions to mitigate risks
8. Report the results of Risk Assessment in line with organisational procedures
9. Communicate the results and implications of risk assessments to relevant persons using media, format and structures which meet the needs of the intended audience
10. Evaluate organisational procedures for Risk Assessment

Unit 4520-445 Investigating information security incidents

Level: **3**
Credit value: **9**
UAN: **F/505/5793**

Unit aim

This unit aims to develop the knowledge and skills required to investigate a security incident. Upon completion of this unit, learners will be able to gather information that can be used to determine the impact of a security incident and make recommendations regarding the mitigation of the associated risks.

Learning outcomes

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

1. Be able to gather information to investigate information security incidents
2. Be able to investigate Information security incidents

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **23** hours should be allocated for this unit.

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-445 Investigating information security incidents

Assessment Criteria

Outcome 1 Be able to gather information to investigate information security incidents

The learner can:

1. Plan the activities that will be undertaken to gather information regarding the incident
2. Gather information regarding the incident using appropriate tools/methods
3. Maintain a record of the activities undertaken

Outcome 2 Be able to investigate Information security incidents

The learner can:

1. Analyse the gathered information to identify the type and scale of the incident
2. Prepare recommendations on the actions to be undertaken to mitigate the incident
3. Inform stakeholders of findings regarding the incident and how it can be mitigated in line with organisational policies

Unit 4520-446 Carrying out information security risk management

Level: **4**
Credit value: **12**
UAN: **L/505/5814**

Unit aim

This unit aims to develop the knowledge and skills required to manage information security risks. Upon completion of this unit, learners will be able to gather information that can be used to develop information security risk contingency plans and manage the identified risks.

Learning outcomes

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

1. Be able to develop Information Security risk contingency plans
2. Be able to manage information security risks

Guided learning hours

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

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-446 Carrying out information security risk management

Assessment Criteria

Outcome 1 Be able to develop Information Security risk contingency plans

The learner can:

1. Interpret given risk management briefs to identify the information assets and system components to be covered by the risk contingency plan
2. Verify the scope of identified information assets and system components with relevant persons
3. Develop risk contingency plans on a given analysis of the probability and impact of all identified risks
4. Justify the range of response actions that may be used to mitigate risks
5. Evaluate risk contingency plans against external standards and legislation
6. Record Information Security risk contingency plans in line with organisational requirements

Outcome 2 Be able to manage information security risks

The learner can:

1. Manage defined response actions to risks which impact the integrity of information assets and system components following organisational procedures and timelines
2. Report any risks arising for which no response actions have been defined to the relevant persons following organisational procedures and timelines
3. Report on information security risk management activities following organisational procedures
4. Communicate the results and implications of risk management activities to relevant persons using media, format and structures which meet the needs of the intended audience
5. Evaluate organisational procedures for risk management

Unit 4520-447 Carrying out information security audits

Level: **4**
Credit value: **12**
UAN: **A/505/5811**

Unit aim

This unit aims to develop the knowledge and skills required to plan and undertake information security audits. Upon completion of this unit, learners will be able to plan and undertake activities associated with undertaking security audits.

Learning outcomes

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

1. Be able to prepare for information security audit activities
2. Be able to carry out information security audit activities

Guided learning hours

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

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-447 Carrying out Information Security audits Unit 4520-447 Carrying out information security audits

Assessment Criteria

Outcome 1 Be able to prepare for information security audit activities

The learner can:

1. Interpret given information security audit briefs to identify the information assets and system components to be audited
2. Identify sources of information relating to the information assets and system components in scope
3. Develop audit plans, following organisational procedures, which will ensure a thorough assessment of security compliance across the whole scope of the audit
4. Verify audit scope and plans with relevant persons

Outcome 2 Be able to carry out information security audit activities

The learner can:

1. Carry out information security audits following organisational procedures
2. Critically review information and data relating to information assets and system components to assess security compliance
3. Report any security non-compliance to the relevant persons in line with organisational procedures and timelines
4. Report on audit activities following organisational procedures
5. Make justified recommendations for actions to be taken to improve security compliance to relevant persons using media, format and structures which meet the needs of the intended audience

Unit 4520-448 Carrying out Information security forensic examinations

Level: **4**
Credit value: **9**
UAN: **M/505/5806**

Unit aim

This unit aims to develop the knowledge and skills required to undertake forensic examinations following an issue involving information to ensure that evidence is preserved. Upon completion of this unit, learners will be able to undertake the actions required to prevent evidence being compromised by the activities undertaken when investigating an issue involving information security.

Learning outcomes

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

1. Be able to carry out Information Security forensic examinations

Guided learning hours

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

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-448 Carrying out Information security forensic examinations

Assessment Criteria

Outcome 1 Be able to carry out Information Security forensic examinations

The learner can:

1. Carry out forensic examinations following organisational procedures
2. Analyse system information for evidence of actual or attempted breaches of security policy or legislation
3. Report any identified actual or attempted breaches of security to the relevant persons following organisational procedures and timelines
4. Use security tools to analyse the integrity of software
5. Take actions to secure information assets and system components subject to actual or attempted breaches of security in line with organisational timelines
6. With the authorisation of relevant persons, seize evidence in accordance with legislation and following organisational procedures
7. Seize evidence, minimising disruption to the organisation and maintaining evidential integrity
8. Record all activities undertaken so that they can justify the decisions made

Unit 4520-449 Testing the security of information systems

Level: **4**
Credit value: **15**
UAN: **A/505/5789**

Unit aim

This unit aims to develop the knowledge and skills required to test the information security that has been implemented on a system to establish its effectiveness. Upon completion of this unit, learners will be able to plan and carry out the security testing of information systems.

Learning outcomes

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

1. Be able to plan security testing
2. Be able to carry out security testing

Guided learning hours

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

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-449 Testing the security of information systems

Assessment Criteria

Outcome 1 Be able to plan security testing

The learner can:

1. Develop a context driven test approach to systematically test specified parts of a system in order to assess their information security status
2. Analyse given information assurance requirements to produce information security test acceptance criteria
3. Develop test scripts and plans to ensure that all information assurance requirements are tested
4. Prioritise testing activity to target the most significant threats and vulnerabilities first
5. Select, and where necessary adapt, methods, tools and techniques to conduct penetration testing
6. Define all required test preparation and conclusion activities

Outcome 2 Be able to carry out security testing

The learner can:

1. Ensure that all required preparations are implemented, in line with test plans, prior to carrying out tests
2. Apply test methods, tools and techniques following organisational procedures
3. Record the results of tests using organisational documentation
4. Ensure that all required activities have been correctly implemented following the completion of testing in line with test plans
5. Critically evaluate the results of testing to accurately identify specific vulnerabilities
6. Prioritise identified vulnerabilities against information assurance requirements
7. Determine and justify actions to mitigate identified vulnerabilities
8. Report the results of test activities following organisational procedures
9. Communicate the results and implications of test activities to relevant persons using media, format and structures which meet the needs of the intended audience
10. Evaluate organisational procedures for carrying out security testing

Unit 4520-450 Database design concepts

Level: **4**
Credit value: **15**
UAN: **R/601/0447**

Unit aim

This unit aims to develop the knowledge and skills required to design, create and support databases. Upon completion of this unit, learners will have developed an understanding of entity-relationship modelling, normalisation and database developmental methodology.

Learning outcomes

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

1. Understand databases and data management systems
2. Understand database design techniques
3. Be able to design, create and document databases

Guided learning hours

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

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-450 Database design concepts

Assessment Criteria

Outcome 1 Understand databases and data management systems

The learner can:

1. Analyse the key issues and application of databases within organisational environments
2. Critically evaluate the features and advantages of database management systems

Outcome 2 Understand database design techniques

The learner can:

1. Analyse a database developmental methodology
2. Discuss entity-relationship modelling and normalisation

Outcome 3 Be able to manage a project

The learner can:

1. Apply the database developmental cycle to a given data set
2. Design a fully functional database (containing at least four inter-relational tables) including user interface
3. Evaluate the effectiveness of the database solution and suggest methods of improvement
4. Provide supporting user and technical documentation

Unit 4520-451 Testing IT and telecoms systems

Level: **4**
Credit value: **15**
UAN: **K/504/5503**

Unit aim

This unit aims to develop the knowledge and skills required to plan and undertake testing of IT & telecoms systems, including the use of appropriate tools/methods to gather and analyse data. Upon completion of this unit, learners will have developed an understanding of how to plan testing of IT & telecoms systems and use a verity of tools/methods in different situations.

Learning outcomes

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

1. Understand the principles of IT & telecoms testing
2. Plan for the testing of an IT or telecoms system
3. Control the testing of system components
4. Evaluate test results

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-451 Testing IT and telecoms systems

Assessment Criteria

Outcome 1 Understand the principles of IT & telecoms testing

The learner can:

1. Explain the purposes of testing
2. Explain the factors which determine the applicability of different classes of test
3. Explain the importance of preparation and conclusion activities associated with testing and the circumstances in which they may be required
4. Explain organisational requirements and procedures for testing
5. Explain organisational requirements and procedures for testing

Outcome 2 Plan for the testing of an IT or telecoms system

The learner can:

1. Analyse available information to correctly define the system functionality to be tested and the purpose of the test
2. Select and document the types, sequences and numbers of tests required to thoroughly test the defined system functionality
3. Select, and where necessary adapt, test equipment or software to be used
4. Accurately determine the types and amounts of inputs and expected outputs for the planned tests
5. Define all required test preparation and conclusion activities

Outcome 3 Control the testing of system components

The learner can:

1. Ensure that all required preparations are correctly implemented prior to carrying out tests
2. Instruct others in the effective use of test equipment or software
3. Ensure that all required activities have been correctly implemented following the completion of testing
4. Develop the documentation to be used for recording test results
5. Contribute to the development of organisational test strategy

Outcome 4 Evaluate test results

The learner can:

1. Ensure that records of individual tests are correctly analysed to identify discrepancies between actual and expected outputs and the source of any recorded errors
2. Investigate and document the probable causes of identified discrepancies and errors
3. Examine multiple test records to identify trends or recurring discrepancies and errors

Unit 4520-453 Designing and developing object-oriented computer programs

Level: **4**
Credit value: **15**
UAN: **T/601/3308**

Unit aim

The aim of this unit is to teach the concepts of designing and developing object-orientated programs. As part this unit, the learner will learn some of the key elements of object-orientated languages such as how to declare file structures and how to use some of the predefined functions. The learner will have an opportunity to use what they have learnt to modify an existing program to improve its quality or write a new program. The learner will test the revised code and record expected and actual results.

Learning outcomes

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

1. Design object-oriented programs to address loosely defined problems
2. Produce a working object-oriented program which meets the design specification
3. Develop object-oriented programs that reflect established programming and software engineering practice
4. Develop test strategies and apply these to object-oriented programs
5. Develop design documentation for use in program maintenance and end-user documentation

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **90** hours should be allocated for this unit.

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-453 Designing and developing object-oriented computer programs

Assessment Criteria

Outcome 1 Design object-oriented programs to address loosely-defined problems

The learner can:

1. Identify a set of classes and their interrelationships to address the problem
2. Make effective use of encapsulation, inheritance and polymorphism
3. Select and reuse pre-existing objects and templates specialising as required
4. Structure the design so that objects communicate efficiently
5. Specify the properties and behaviour of classes to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms
6. Record the design using well-established notations

Outcome 2 Produce a working object-oriented program which meets the design specification

The learner can:

1. Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification
2. Make effective use of the features of the programming environment
3. Make effective use of user interface components in the implementation of the program
4. Make effective use of a range of debugging tools

Outcome 3 Develop object-oriented programs that reflect established programming and software engineering practice

The learner can:

1. Apply standard naming, layout and comment conventions
2. Apply appropriate data validation and error handling techniques

Outcome 4 Develop test strategies and apply these to object-oriented programs

The learner can:

1. Develop and apply a test strategy consistent with the design identifying appropriate test data
2. Apply regression testing consistent with the test strategy
3. Use appropriate tools to estimate the performance of the program

Outcome 5 Develop design documentation of use in program maintenance and end-user documentation

The learner can:

1. Record the final state of the program in a form suitable for subsequent maintenance
2. Provide end-user documentation that meets the user's needs

Unit 4520-501 Customer apparatus and line installation

Level: **3**
Credit value: **22**
UAN: **A/501/5888**

Unit aim

This unit aims to develop the knowledge and skills required to work safely while running cables into 'End User' premises. Upon completion of this unit, learners will have developed an understanding of key elements of a local access network and methods that can be implemented to ensure that a safe working environment is maintained.

Learning outcomes

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

1. Run cables into the 'End User' premises and fit main and extension telephone sockets
2. Run dropwires in the BT overhead network
3. Cross connect circuits in primary and secondary cross connection points
4. Work safely on wooden poles, steps and ladders
5. Carry out manual handling using the kinetic method

Guided learning hours

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

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-501 Customer apparatus and line installation

Assessment Criteria

Outcome 1 Run cables into the 'End User' premises and fit main and extension telephone sockets

The learner can:

1. Cite the importance for superb customer service
2. Recognize the key elements of the local access network
3. Drill holes to ISIS standard
4. Install External and Internal cabling in a customers' premises
5. Wire PST/NTE sockets
6. State the different standard line conditions found in the Network
7. Use the HAWK tester to identify line conditions and faults.

Outcome 2 Run dropwires in the BT overhead network

The learner can:

1. Identify and use the current tools and equipment required to provide, retention, recover and renew dropwire from customers premises to wooden and hollow poles
2. Provide, retention, renew and recover a single span of Dropwire from a hollow pole to a simulated customer premises, which includes a road crossing
3. Apply the quality standards relating to working with dropwires, Customer Lead-in, Block Terminals and Customer Fixings when carrying out dropwire provision, renewal and recovery
4. State the current types of customers dropwire fixing
5. Provide a customer dropwire fixing using an Eyebolt Expanding 1A
6. Provide a customers' lead-in, up to but not including the point of entry into the customers premises
7. Use Slide Rule Fixing Height - 1A, 1B and 1C. Provide, retention and recover a single span of Dropwire from a wooden pole to a simulated customer premises
8. Identify the types of Low Voltage and High Voltage overhead power lines shown in the BT Health and Safety Handbook
9. State the restrictions of using Dropwire near power lines
10. State the minimum separation distances between Dropwires and power lines
11. State the correct equipment for measuring the height of power lines
12. State where Lightning Protection is fitted. Provide, renew and recover a single span of Dropwire from a wooden pole to a simulated customer premises which includes a road crossing
13. Provide and recover a single span of dropwire, from a simulated customers premises to wooden pole A The dropwire span between pole A and the customer crosses over Low Voltage power
14. Carry out the correct wiring and terminating practices for Cable Dropwire at Box Connections 18A/19A, Block Terminals 76/86 Series, Block Terminal 71A, Block Terminals 41/41A, Box Connection 16A, Block Terminal 66B and NTE 5

Outcome 3 Cross connect circuits in primary and secondary cross connection points

The learner can:

1. State the purpose of Primary and Secondary Cross Connection Points (PCPs and SCPs)
2. List the termination systems used in PCPs and SCPs
3. State the quality standards required when provide jumpers on the following termination systems:
    - P100/PC100
    - SCC No 1
    - SCC No 2
    - BIX MCCS
    - 3M MS2 MCCS
    - Krone MCCS
    - Quante MCCS.
4. Cross connect circuits on and between Krone and Quante MCCS

Outcome 4 Work safely on wooden poles, steps and ladders

The learner can:

1. Select and carry a three-section aluminium ladder
2. Undertake a pre-use check on a three-section aluminium ladder
3. Safely load, secure and remove a ladder extension 4B or 5A from a BT vehicle using both the ladder removal tool (LRT) and the manual method
4. Erect a three-section aluminium ladder against a solid structure and secure them using a variety of ladder stability devices
5. Safely raise and use a drill at the working position on the ladder
6. Undertake a pre-use check on steps folding
7. Use steps folding safely
8. Erect, tie, climb, descend and then lower a three-section aluminium ladder against a wooden pole
9. Check, inspect and fit a Safety Belt No11 ready for use
10. Correctly adjust a Safety Belt No11
11. Correctly carry out a general pole test on the pole to be climbed
12. Safely climb, belt onto and turn on a pole of at least 9m length

Outcome 5 Carry out manual handling using the kinetic method

The learner can:

1. Demonstrate understanding of the principles of:
    - Base Movement
    - Legislation
    - Components of the Spine
    - Causes of Back Pain
    - Safer manual handling
    - Method of holding
    - Manual Handling and Risk Assessments.
2. Carry out practical demonstrations using techniques recommended by ROSPA
3. Carry out practical exercises to practice skills in a safe environment

Unit 4520-502 Fibre telecommunications techniques

Level: **3**
Credit value: **15**
UAN: **H/601/0663**

Unit aim

This unit aims to develop the knowledge and skills required to work safely when undertaking tasks associated with fibre optic cables. Upon completion of this unit, learners will have developed an understanding of the characteristics, termination and splicing of fibre optic cables, as well as methods that can be implemented to ensure that a safe working environment is maintained.

Learning outcomes

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

1. Understand the properties, structures and components included in typical fibre telecommunications networks
2. Understand safe working practices when working with optical fibre networks
3. Know the quality standards and documentation requirements when working on the optical fibre network
4. Prepare and install optical fibre components in exchanges and customer premises
5. Build an external fibre network
6. Know how to construct and re-enter a fibre closure

Guided learning hours

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

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-502 Fibre telecommunications techniques

Assessment Criteria

Outcome 1 Understand the properties, structures and components included in typical fibre telecommunications networks

The learner can:

1. Identify different types of optical fibre
2. Identify the physical components required to build a fibre infrastructure
3. Explain the different structures used in fibre networks, and when different structures should be used

Outcome 2 Understand safe working practices when working with optical fibre networks

The learner can:

1. Identify key safety considerations when working with optical fibre
2. Identify any existing risk assessments for working with fibre networks.
3. Explain how to dispose of redundant or damaged optical fibres

Outcome 3 Know the quality standards and documentation requirements when working on the optical fibre network

The learner can:

1. Explain the quality standards that apply for all installation and maintenance work on the optical fibre network
2. Explain what technical documentation needs to be completed before and after undertaking work on the fibre network

Outcome 4 Prepare and install optical fibre components in exchanges and customer premises

The learner can:

1. Prepare optical fibre components for use
2. Provide fibres from a customer premises point of entry to the equipment fibre pigtails for both two-fibre and single-fibre working
3. Test components before commissioning the components

Outcome 5 Build an external fibre network

The learner can:

1. Prepare cables for splicing
2. Manage cables on single circuit trays
3. Splice fibres cables on single circuit trays

Outcome 6 Know how to construct and re-enter a fibre closure

The learner can:

1. Explain where various fibre options should be used
2. Construct a fibre closure
3. Re-enter an existing closure

Unit 4520-503 Copper cable jointing and closure techniques

Level: **3**
Credit value: **23**
UAN: **L/601/0656**

Unit aim

This unit aims to develop the knowledge and skills required to prepare and terminate copper cables. Upon completion of this unit, learners will have developed an understanding of the characteristics and termination of copper cables, as well as methods that can be implemented to ensure a safe working environment is maintained.

Learning outcomes

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

1. Track and locate underground services using a cable locator
2. Safely assemble and dismantle portable propane equipment
3. Construct and maintain joint closures
4. Construct a temporary joint closure
5. Prepare and joint underground copper cables
6. Prepare and terminate copper cables

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **120** hours should be allocated for this unit.

How is this unit assessed?

Assessment is by a learner portfolio.

Unit 4520-503 Copper cable jointing and closure techniques

Assessment Criteria

Outcome 1 Track and locate underground services using a cable locator

The learner can:

1. Carry out functional checks on a cable locator
2. Use a cable locator to:
    - locate and track an underground cable terminating on a known point
    - locate and track a cable in a duct between two known points
    - locate a blockage in a duct
    - locate a buried cover.
3. Describe the range of underground services (eg electricity, water, gas) and how to identify them.

Outcome 2 Safely assemble and dismantle portable propane equipment

The learner can:

1. Explain safety considerations when working with and storing propane equipment
2. Safely connect and disconnect portable equipment to a propane cylinder
3. Check connected equipment for leaks
4. Carry out an emergency repair to a gas hose
5. Safely store and transport propane equipment
6. Explain the procedures to follow in case of an incident

Outcome 3 Construct and maintain joint closures

The learner can:

1. Safely enter an existing joint closure
2. Explain the actions to take if the joint is found to be defective (eg wet or corroded joints)
3. Explain the actions to take if an obsolete closure is found on a cable
4. Explain when a closure can and cannot be used to house internal and external cables
5. Close a joint (eg inline or cap end closures) to the required quality standards

Outcome 4 Construct a temporary joint closure

The learner can:

1. Explain the circumstances in which a temporary joint closure is appropriate
2. Fit a temporary closure to a non-pressurised cable

Outcome 5 Prepare and joint underground copper cables

The learner can:

1. Prepare copper cables for jointing
2. Describe the circuit identification systems for copper cables
3. Select and use the appropriate connectors to construct a joint according to manufacturer's instructions
4. Use a tester to carry out continuity checks on jointed circuits

Outcome 6 Prepare and terminate copper cables

The learner can:

1. Prepare a copper cable for termination, according to type of connection required
2. Use an appropriate tool to terminate wires on to the terminal block

Unit 4520-504 Understand planning supervising and managing work at height

Level: **3**
Credit value: **2**
UAN: **H/504/2731**

Unit aim

This unit aims to develop the knowledge and skills required to supervise and manage individuals working at height. Upon completion of this unit, learners will have developed an understanding of methods that can be implemented to ensure a safe working environment is maintained.

Learning outcomes

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

1. Understand the principles of work at height
2. Understand the requirements of a workplace health and safety risk assessment
3. Understand the factors that influence selection of work at height equipment
4. Know factors that influence the selection of staff and contractors for work at height
5. Understand planning considerations for work at height
6. Understand the supervision and management of work at height

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **16** hours should be allocated for this unit.

How is this unit assessed?

Assessment is by short answers questions which are centre marked.

This assessment is shared with unit 6144-301 and the assessments and marking scheme can be downloaded from here: **http://www.cityandguilds.com/qualifications-and-apprenticeships/utilities/utilities/6144-understanding-planning-supervising-and-managing-working-at-height**

Unit 4520-504 Understand planning supervising and managing work at height

Assessment Criteria

Outcome 1 Understand the principles of work at height

The learner can:

1. List key standards and regulations relevant to work at height and outline their purpose
2. Explain the client and consultant relationship including the client's perception that the use of consultants mitigates their legal responsibilities towards health and safety
3. Explain the type of information provided by the schedules under the work at height regulations
4. Define what is meant by work at height
5. Explain principles used to control work at height

Outcome 2 Understand the requirements of a workplace health and safety risk assessment

The learner can:

1. Define the terms hazards, risks and residual risks
2. Identify working practices that could cause risks to self and others when working at height
3. Produce a risk assessment and method statement for work at height and present the findings and control recommendations
4. Evaluate a risk assessment to identify existing controls are suitable and sufficient revising accordingly

Outcome 3 Understand the factors that influence selection of work at height equipment

The learner can:

1. Explain how to select and justify the use of appropriate equipment in relation to the hierarchy of controls
2. Explain the advantages and disadvantages of collective controls
3. Explain the advantages and disadvantages of personal controls
4. Explain where to obtain current relevant information instruction and training on different types of equipment
5. Explain the importance of following suppliers and manufacturer's instructions when using equipment materials and products

Outcome 4 Know factors that influence the selection of staff and contractors for work at height

The learner can:

1. Explain criteria for selecting staff for work at height
2. Explain criteria for selecting contractors for work at height

Outcome 5 Understand planning considerations for work at height

The learner can:

1. Explain the use of different types of documentation required when planning work at height
2. State ways of preventing injuries from falling objects
3. State ways of preventing falls through fragile materials
4. Explain key considerations when assessing site conditions for work at height
5. Describe the importance of inspecting equipment and keeping records
6. Explain the inspection requirements for different types of work equipment
7. Describe how to evaluate site information in order to develop method statements
8. Describe key information contained within a rescue plan for work at height

Outcome 6 Understand the supervision and management of work at height

The learner can:

1. Explain the importance of site supervision for own employees
2. Explain the importance of site supervision for persons not directly employed but under own control on site
3. State action required when identifying behaviours that deviate from risk assessments and method statements
4. Describe the action to be taken in the event of a dangerous occurrence
5. Describe the action to be taken in the event of a near miss

Unit 4520-505 Top person for high risk confined spaces

Level: **3**
Credit value: **2**
UAN: **H/601/7399**

Unit aim

The aim of this unit is to assess learners in acting as top man / person in a high risk confined space environment. It involves overseeing a work team preparing to work safely and entering and exiting the confined space safely. The unit also assesses learners monitoring procedures and deal with emergencies. There is also a behavioural emphasis on the candidate undertaking the assessment in an efficient and safe manner. The unit also requires the learner to demonstrate sufficient knowledge of working as a top man in a high-risk environment through a mix of practical observation and written assessment

Learning outcomes

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

1. Prepare to act as top man for high-risk teams working in confined spaces
2. Oversee safe entry and exit to high risk confined spaces
3. Monitor work of teams to ensure procedures are followed
4. Prepare for and deal with emergencies
5. Use appropriate behaviour for carrying out top man work in high risk confined spaces
6. Use appropriate knowledge for carrying out top person work in high risk confined spaces
7. Apply relevant industry standards for top person work in high risk confined spaces

Guided learning hours

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

How is this unit assessed?

- Direct observation of the learner overseeing work in a high risk confined space
- Short answer questions which are externally set and centre marked.

These are shared with 6150, and contained within the 6150-54 assessment pack saved here:

http://www.cityandguilds.com/qualifications-and-apprenticeships/utilities/utilities/6150-confined-spaces#tab=information&acc=level3

Notes for guidance

This top man role for high risk also extends to interpretation, planning, supervision, coordination and accountability for the team and the work being undertaken in the confined space during both planned work and emergency situations.

In this regard, the role is autonomous and pitched at a higher level than is generally seen of a traditional 'top-man'. This is further emphasised when it is taken into account that in this role the learner will also be responsible for committing a work team in potentially non-routine environments, which is a significant departure in terms of responsibility, skills and competence of the traditional 'top-man'.

Important: completion of this unit does not make the learner competent to enter / work in a confined space.

Unit 4520-505 Top person for high risk confined spaces

Assessment Criteria

Outcome 1 Prepare to act as top man for high-risk teams working in confined spaces

The learner can:

1. Interpret the work plan and arrange for the necessary equipment to be available
2. Arrange for all required equipment to be available prior to entering the site
3. Determine work team activities
4. Put together a competent work team
5. Allocate activities to each team role
6. Confirm all team members know and understand their roles
7. Brief the work team on the nature of the specific confined space
8. Carry out a real-time risk assessment before starting work
9. Organise and maintain a safety zone around the work site
10. Confirm communications systems are set up, tested, and are working before team move away from the entry point

Outcome 2 Oversee safe entry and exit to high risk confined spaces

The learner can:

1. Check atmospheric conditions are safe before the work team enters the confined space
2. Oversee and check the work team enter and exit in line with procedures
3. Make sure procedures regarding the carrying and use of appropriate respiratory protective equipment (RPE) are followed
4. Make sure the work team use the detection equipment and entry equipment correctly
5. Remedy any incorrect activities with the team member
6. Oversee recovery of equipment and tools from site when work is finished

Outcome 3 Monitor work of teams to ensure procedures are followed

The learner can:

1. Control access of people and vehicles around the entry point
2. Resolve any problems connected to the work or team members with the designated personnel
3. Act immediately to remedy any unsafe activity, equipment, and environmental conditions
4. Monitor continuously the work team and ensure compliance with procedures
5. Monitor environmental readings regularly and respond to information from monitoring equipment
6. Communicate regularly with the work team at all stages of the work
7. Initiate site hygiene procedures
8. Close down and make the work area safe when work is finished
9. Make reports and complete all documentation and deposit them with the designated people

Outcome 4 Prepare for and deal with emergencies

The learner can:

1. Confirm the emergency arrangements, procedures and communications systems are in place and working properly
2. Make the emergency arrangements known to all work team, support personnel, and off-site personnel
3. Get all rescue equipment on site as specified in emergency procedures
4. Set up exclusion zones to prevent entry by unauthorised people following emergency situations
5. Arrange for rescue equipment to be in place before allowing entry to confined space
6. Start emergency procedures immediately a dangerous situation arises
7. Supervise exit procedures
8. Maintain control over work team members during an emergency
9. Supervise the use of emergency equipment
10. Follow and maintain emergency procedures throughout the incident
11. Record and report the emergency incident and its circumstances
12. Arrange for basic first aid to be available to recovered surface casualties
13. Maintain emergency communications
14. Hand-over to emergency services
15. Secure and maintain sites for post-rescue investigations

Outcome 5 Use appropriate behaviour for carrying out top man work in high risk confined spaces

The learner can:

1. demonstrate that they are vigilant to possible risks and hazards

Outcome 6 Use appropriate knowledge for carrying out top person work in high risk confined spaces

The learner can:

1. Understand their responsibilities to comply with the main principles of health and safety and environmental legislation and regulations
2. Know about Industrial Standards
3. Have a working knowledge of the approved codes of practice and guidance for working safely in confined spaces
4. Know about the definition of confined spaces and their nature and characteristics
5. Know about the definitions of hazardous situations and different types and categories of hazards
6. Know how emergency situations can arise in a confined space
7. Know about manufacturers' instructions relating to the use of equipment, tools, and appropriate RPE
8. Know about manufacturers' instructions relating to the use of PPE
9. Know about legislation and approved codes of practice and guidelines for safe use of appropriate RPE for working and escape purposes
10. Know about the limitations for using rescue equipment
11. Know about working as a member of a team
12. Know about the different roles and responsibilities for dealing with emergencies
13. Know how to deal with injuries to personnel and the general public
14. Know how to deal with irregularities and abnormal situations
15. Know about the different types and categories of emergency situation

Outcome 7 Apply relevant industry standards for top person work in high risk confined spaces

The learner can:

1. Map organisations' classifications into National Occupational Standards for confined spaces
2. Understand the hazards, substances, and situations associated with contaminated atmospheres
3. Understand entry procedures for different types and risk levels of confined spaces environments
4. Understand how to carry out real-time assessment of risks and hazards
5. Understand how to use work authorizations and permits
6. Understand procedures and methods of working suitable to the confined space risk level and local conditions
7. Understand how to minimise the risks and hazards for the work to be carried out
8. Understand how to use ventilation systems
9. Understand how to reduce risk and injury
10. Understand and use local procedures
11. Understand how to monitor conditions and work activity
12. Understand decontamination procedures
13. Understand communications methods which are suitable for the site and its conditions
14. Understand how to resolve problems speedily and with the designated personnel
15. Understand how to follow manufacturers' instructions for using equipment
16. Understand how to prepare and check equipment
17. Understand how to ensure equipment and tools are fit-for-purpose and how to use them safely
18. Understand methods and techniques for using and wearing PPE
19. Understand how to prepare and use appropriate RPE for working and escape purposes
20. Understand the responsibilities of a rescue team and its individual members
21. Understand the responsibilities of managing work teams
22. Understand reporting systems for routine work activities and resolving problems
23. Understand procedures for dealing with emergencies
24. Understand rescue and recovery procedures in emergency situations
25. Understand communications and reporting systems for emergency situations

Unit 4520-580 Knowledge and information management

Level: 5
Credit value: 5
UAN: A/504/0399

Unit aim

This unit aims to develop the knowledge and skills required for a knowledge management culture. Upon completion of this unit, learners will have developed an understanding of the importance of knowledge and information management, including the key knowledge management processes required for innovation.

Learning outcomes

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

1. Understand the concept and importance of knowledge management in terms of an organisation's knowledge assets and their management
2. Understand the key knowledge management processes required for innovation
3. Be able to develop a framework for establishing a knowledge management culture

Guided learning hours

Although patterns of delivery are likely to vary considerably, it is recommended that **14** hours should be allocated for this unit.

How is this unit assessed?

This unit is assessed by portfolio of evidence.

Unit 4520-580 Knowledge and information management

Assessment Criteria

Outcome 1 Understand the concept and importance of knowledge management in terms of an organisation's knowledge assets and their management

The learner can:

1. Explain the relationship between data, information, knowledge and wisdom
2. Explain the relationship between individual knowledge and organisational knowledge
3. Apply analysis and modelling techniques to identify knowledge assets, within own area of organisation
4. Evaluate the actual and potential knowledge assets, within own area of organisation
5. Present a rationale for capturing and managing knowledge, within own area of organisation

Outcome 2 Understand the key knowledge management processes required for innovation

The learner can:

1. Explain what is required to create, store, apply and integrate knowledge
2. Evaluate the impact of intellectual property rights on the organisation

Outcome 3 Be able to develop a framework for establishing a knowledge management culture

The learner can:

1. Explain the contribution that significant knowledge assets have on the organisation
2. Evaluate the knowledge requirements for the organisation's operations
3. Evaluate the organisations current framework for enabling knowledge sharing within the organisation
4. Recommend improvements to the organisations current framework for enabling knowledge sharing within the organisation

Appendix 1 Glossary

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 handwritten, 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 (i.e. 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

Appendix 2 Change detail

Version and date	Change detail	Section
1.1 Oct 2012	Amendment to the credit value for unit 208	Structure of the units
2.0 Jan 2013	Missing Units 190 & 191 Added	Structure of the units
2.1 March 2013	Amendment to GLH for unit 214 and corrected unit formatting.	Structure of the units
3.0 October 2013	Missing Unit 360 added.	Structure of the units
3.1 January 2014	Correct GLH and credit value of unit 220	Units
3.2 March 2014	Corrected assessment criteria 2.1 in unit 308 to match Ofqual Register	Units
3.3 March 2014	Corrected UAN number for unit 304	Units
4.0 June 2014	Units 501 – 505 units added	Structure of the units
6.0 December 2015	Units 438-451 and 580 added.	Structure of the units
	Unit 288 – assessment method corrected to Portfolio Unit 384 title corrected Unit 416 title corrected Unit 580 credit value corrected to 14	Units
7.0 February 2017	Unit 4520-416 title corrected	Unit title
8.0 February 2022	Units deleted and added as part of a structural amendment to the qualification. References to e-skills UK removed. Minor amendments to text for clarity.	Units
8.1 August 2022	Unit 4520-426 added Unit 580 credit value corrected to 5	Units

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