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|------------------------|------------------------------|
| <b>Unit Title:</b>     | <b>Networking principles</b> |
| OCR unit number:       | 24                           |
| Unit reference number: | J/601/3250                   |
| Level:                 | 3                            |
| Credit value:          | 10                           |
| Guided learning hours: | 75                           |

## Unit aim

The aim of this unit is that learners will:

- Understand physical and logical topologies and systems
- Understand the Open System Interconnection (OSI) model
- Understand the Internet Protocol Suite (TCP/IP)

| Learning Outcomes   | Assessment Criteria   | Knowledge, understanding and skills   |
|---|---|---|
| <p><b>The Learner will:</b></p> <p>1 Understand physical and logical topologies and systems</p> | <p><b>The Learner can:</b></p> <p>1.1 Describe common physical network topologies</p> <p>1.2 Explain the difference between logical and physical network topologies</p> <p>1.3 Describe the network topologies and hardware and software components used to implement common data communication systems</p> <p>1.4 Identify common:</p> <ul style="list-style-type: none"> <li>• cable types and properties</li> <li>• connector types</li> <li>• wiring standards</li> <li>• wireless standards</li> </ul> | <ul style="list-style-type: none"> <li>• the following network topologies: <ul style="list-style-type: none"> <li>- ring</li> <li>- mesh</li> <li>- star</li> <li>- fully connected</li> <li>- line</li> <li>- tree</li> <li>- bus</li> </ul> </li> <li>• the characteristics and advantages/disadvantages of each</li> <li>• the following cable types, their properties and uses: <ul style="list-style-type: none"> <li>- twisted pair</li> <li>- unshielded twisted pair (UTP)</li> <li>- shielded twisted pair (STP)</li> <li>- co-axial cable</li> <li>- fibre-optic cable</li> </ul> </li> </ul> |

| Learning Outcomes  | Assessment Criteria   | Knowledge, understanding and skills   |
|--|---|---|
|  |   | <ul style="list-style-type: none"> <li>• the following connectors and explain which cables they would be used with:               <ul style="list-style-type: none"> <li>- RJ-45</li> <li>- BNC Connector</li> <li>- RJ-11</li> <li>- T-piece connectors</li> <li>- ST connector (straight tip)</li> <li>- SC connector (subscriber connector)</li> <li>- FDDI connector</li> </ul> </li> <li>• identify common wiring standards e.g.: TIA/EIA-568-B</li> </ul> |
| 2 Understand the Open System Interconnection (OSI) model | 2.1 Describe the OSI model and how its layers relate to each other<br>2.2 Explain the function of each layer of the OSI model<br>2.3 Describe the key features, protocols and standards of each OSI layer               | <ul style="list-style-type: none"> <li>• the layers of the OSI model, the key protocols and key features of each layer and their relationships to each other</li> </ul>   |
| 3 Understand the Internet Protocol Suite (TCP/IP)        | 3.1 Describe the Internet Protocol Suite (TCP/IP) and the function of its four layers<br>3.2 Describe the key features, protocols and standards of each TCP/IP layer<br>3.3 Explain how TCP/IP relates to the OSI model | <ul style="list-style-type: none"> <li>• TCP/IP</li> <li>• the function of the 4 layers</li> <li>• key features, protocols and standards of each layer</li> <li>• how it relates to the OSI model</li> </ul>  |

## Assessment

The qualification has been designed to develop knowledge, understanding and skills in the full range of functions involved in the planning and control, hardware, software and systems installation, software solutions and the production of customer support materials. It also provides opportunities for learners to study towards system and network management, to specialise in one or more specific programming languages in addition to being able to take units that are vendor specific.

Each unit within the specification is designed around the principle that candidates will build a portfolio of evidence relating to progression towards meeting the unit assessment objectives.

The unit assessment objectives reflect the demands of the learning outcomes for each unit.

In order for candidates to be able to effectively progress towards meeting the requirements of each assessment objective, tutors must make sure that the supporting knowledge, understanding and skills requirements for each objective are fully addressed. The identified knowledge, understanding and skills are not exhaustive and may be expanded upon or tailored to particular contexts to which the unit is being taught and the assessment objective applied.

We recommend that teaching and development of subject content and associate skills be referenced to real vocational situations, through the utilisation of appropriate industrial contact, vocationally experienced delivery personnel, and real life case studies.

All the learning outcomes and assessment criteria must be clearly evidenced in the submitted work, which is externally moderated by OCR.

Results will be Pass or Fail.

## Guidance on assessment

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Candidates do not have to achieve units in any particular order and tutors should tailor learning programmes to meet individual candidate needs. It is recommended that, wherever possible, centres adopt a holistic approach to the delivery of the qualification and identify opportunities to link the units.

Centres are free to deliver this qualification using any mode of delivery that meets the needs of their candidates. Whatever mode of delivery is used, centres must ensure that learners have appropriate access to appropriate resources and consider the candidates' complete learning experience when designing learning programmes. This is particularly important in relation to candidates studying part time alongside real work commitments where candidates may bring with them a wealth of experience that should be utilised to maximum effect by tutors and assessors.

It is difficult to give a detailed answer to how much evidence is required as it depends on the type of evidence collected and the judgement of assessors. The main principles, however, are as follows: for a candidate to be judged competent in a unit, the evidence presented must satisfy:

- all the items listed, in the section 'Learning Outcomes'
- all the areas in the section 'Assessment Criteria'

Questioning the candidate is normally an ongoing part of the assessment process, and is necessary to:

- test a candidate's knowledge of facts and procedures
- check if a candidate understands principles and theories *and*
- collect information on the type and purpose of the processes a candidate has gone through
- candidate responses must be recorded

The quality and breadth of evidence provided should determine whether an assessor is confident that a candidate is competent or not. Assessors must be convinced that candidates working on their own can work independently to the required standard.

## Additional information

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For further information regarding administration for this qualification, please refer to the OCR document '*Admin Guide: Vocational Qualifications*' on the OCR website [www.ocr.org.uk](http://www.ocr.org.uk) .