

Unit Title:	Systems Architecture
OCR unit number	34 (A/601/3505)
Level:	4
Credit value:	10
Guided learning hours:	80
Unit expiry date:	31/03/2015

Unit purpose and aim

This unit will enable candidates to:

- understand the representation of information within a computer and the way it is processed.
- use and develop the operating environment of current computer systems
- understand the communication process in distributed operating systems and computer networks
- understand distributed applications and transaction processing in mainframe systems

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
<p>The Learner will:</p> <p>1 Understand the representation of information within a computer and the way it is processed.</p>	<p>The Learner can:</p> <p>1.1 Explain how number systems and data representation are used to store information in a computer</p> <p>1.2 Explain the role of input, output and storage devices</p> <p>1.3 Describe the characteristics of C.P.U. components and the operation of the Fetch Execute Cycle</p> <p>1.4 Describe the operation of a peripheral device, controller hardware and physical connection using correct technical terminology and reference to relevant standards</p>	<p>Candidates must have a detailed understanding of the:</p> <ul style="list-style-type: none"> • number systems and data representation used for the storage of information eg ASCII EBCDIC Unicode, Binary Numbered System and Binary Decimal Code • role of input, output and storage devices • characteristics of CPU components • operation of the Fetch Execute Cycle • operation of a peripheral device, controller hardware, physical connection and recognised standards requirements

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
2 Use and develop the operating environment of current computer systems.	2.1 Use and configure operating system interfaces and functions 2.2 Explain the role of process management and concurrent processes in computer operating systems 2.3 Describe how operating system features can contribute to data and system security	Candidates must have a detailed understanding of: <ul style="list-style-type: none"> • how to use and configure the interfaces and functions of a range of operating systems • the role of process management and concurrent processes • how data and system security can be supported by features within an operating system
3 Understand the communication process in distributed operating systems and computer networks	3.1 Describe the function and operation of distributed operating systems 3.2 Describe the functions of data communications systems in enabling network and distributed systems	Candidates must have a detailed understanding of: <ul style="list-style-type: none"> • Distributed operating systems • Data communication systems and how they support network and distributed systems
4 Understand distributed applications and transaction processing in mainframe systems	4.1 Describe the operation and functions of mainframe systems 4.2 Describe the evolution of and characteristics of distributed applications 4.3 Describe data and process distribution 4.4 Explain distribution and transaction transparency	Candidates must have a detailed understanding of: <ul style="list-style-type: none"> • mainframe systems • the evolution and characteristics of distributed applications • data and process distribution • distribution and transaction transparency

1.1.1 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 criteria.

The unit assessment criteria 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 criteria, tutors must make sure that the supporting knowledge, understanding and skills requirements for each criteria 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 criteria applied.

We recommend that teaching and development of subject content and associated 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.

Evidence requirements

All aspects of the assessment criteria must be covered and evidence must be available that shows where and how the assessment objectives have been achieved.

Assessment Criterion 1

Through a range of activities candidates must provide evidence which covers all aspects of the assessment criteria.

The evidence must clearly show how the assessment objectives have been met.

Candidates must provide a detailed report using correct terminology throughout to describe:

- how number systems and data representation are used to store information
- the role of the input, output and storage devices
- the characteristics of CPU components
- the different parts of the Fetch Execute Cycle and how they operate
- the operation of a peripheral device, controller hardware, physical connection explaining the relevant standards involved.

Candidates should clearly detail all the criteria listed to evidence knowledge and understanding

Assessment Criterion 2

Through a range of activities candidates must provide evidence which covers all aspects of the assessment criteria.

The evidence must clearly show how the assessment objectives have been met.

Candidates must provide a detailed report supported by relevant screenshots describing the following:

- how to configure the interfaces and functions of at least three different operating systems, justifying the reasons for carrying out the configurations
- the role of process management and concurrent processes ie what is it/are they and how does it/they work
- the features within three different operating systems that can contribute to data and system security.

Candidates should clearly detail all the criteria listed to evidence knowledge and understanding.

Assessment Criterion 3

Through a range of activities candidates must provide evidence which covers all aspects of the assessment criteria.

The evidence must clearly show how the assessment objectives have been met.

Candidates must provide a detailed report which may include appropriate screenshots relating to electronic sources and/or documentation used describing:

- distributed operating systems to include:
 - what they are
 - their functionality
 - how they work

- the role of data communication systems and how they enable network and distributed systems

Candidates should clearly detail all the criteria listed to evidence knowledge and understanding.

Assessment Criterion 4

Through a range of activities candidates must provide evidence which covers all aspects of the assessment criteria.

The evidence must clearly show how the assessment objectives have been met.

Candidates must provide a detailed report which may include appropriate screenshots relating to electronic sources and/or documentation used describing:

- mainframe systems, their operations and functions
- the evolution and characteristics of distributed applications
- data and process distribution
- distribution and transaction transparency

The descriptions should include:

- what they are
- why they are used
- how they are used

Candidates should clearly detail all the criteria listed to evidence knowledge and understanding.

Candidates are encouraged to choose activities which will allow them to cover all or a majority of the criteria at one time. It is not necessary to use different activities for each element of the criterion.

Guidance on assessment and evidence requirements

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 an 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 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

For further information regarding administration for this qualification, please refer to the OCR document '*Admin Guide: Vocational Qualifications*' (A850) on the OCR website www.ocr.org.uk .