OCR
Oxford Cambridge and RSA

Unit Title:	**Advanced data representation and manipulation for IT**
OCR unit number:	30
Unit reference number:	F/601/3246
Level:	3
Credit value:	7
Guided learning hours:	60

Unit aim

The aim of this unit is that learners will:

- Be able to apply matrix methods
- Be able to apply series, probability and recursions
- Be able to apply graph theory

Learning Outcomes	Assessment Criteria
The Learner will: 1 Be able to apply matrix methods	**The Learner can:** 1.1 Explain matrices as a method of representing ordered data and their relationship with computer program variable arrays 1.2 Use index notation to reference the cells of a matrix 1.3 Perform add, subtract and scalar multiplication operations on a matrix 1.4 Multiply two matrices 1.5 Find: • the inverse of a matrix by elementary row operations • the transpose of a matrix 1.6 Apply matrix techniques to a range of applications including: • solving simultaneous linear equations • vector transformation and rotation • maps and graphs

Learning Outcomes	Assessment Criteria
2 Be able to apply series, probability and recursions	2.1 Give a functional expression for a series 2.2 Express a series recursively 2.3 Find the sum of a series 2.4 Express probabilities as percentages, fractions and decimals 2.5 Apply series, probability and recursion techniques to develop a solution to a range of problems
3 Be able to apply graph theory	3.1 Describe the components of a graph and their properties 3.2 Explain the characteristics of undirected, directed and mixed graphs 3.3 Represent a set of connected objects as a graph 3.4 Describe the type of problem which can be modelled by a weighted graph

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.

Guidance on assessment

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 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'* on the OCR website www.ocr.org.uk .