SQA Advanced Unit specification: general information for centres

Unit title: Cloud Computing

Unit code: HP1Y 47

Superclass: CE

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Version: 01

Unit purpose

This unit is intended to give candidates an introduction to the fundamentals of cloud computing and the associated terminology and technology. The unit will cover a broad knowledge base in the essentials of cloud computing along with conceptual understanding of the elements associated with cloud computing.

On completion of the unit the candidate should be able to:

1 identify and describe cloud computing fundamentals.
2 identify and describe different cloud delivery and deployment models.
3 devise and implement a cloud strategy for a small to medium-sized enterprise.

Recommended prior knowledge and skills

Access to this unit will be at the discretion of the centre. There are no specific requirements although candidates would benefit from knowledge of fundamentals of hardware and software, as well as the basic concepts of computer networking, the internet and associated services.

Credit points and level

1 SQA credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from National 1 to Doctorates.*

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the support notes of this unit specification.

There is no automatic certification of Core Skills or Core Skill components in this unit.

Context for delivery

If this unit is delivered as part of a group award, it is recommended that it should be taught and assessed within the subject area of the group award to which it contributes.

Unit specification: statement of standards

Unit title: Cloud Computing

The sections of the unit stating the outcomes, Knowledge and/or Skills, and evidence requirements are mandatory.

Please refer to *Knowledge and/or Skills for the unit* and *Evidence requirements for the unit* after the outcomes.

Outcome 1
Identify and describe cloud computing fundamentals.

Knowledge and/or Skills
- Identify and describe types of IT resources.
- Identify and describe cloud components.
- Describe the concepts of virtualisation.

Outcome 2
Identify and describe different cloud delivery and deployment models.

Knowledge and/or Skills
- Identify and differentiate between cloud services.
- Identify and differentiate between public, community, private and hybrid clouds.

Outcome 3
Devise and implement a cloud strategy for a small to medium-sized enterprise.

Knowledge and/or Skills
- Identify the cost benefits of cloud computing.
- Identify and describe cloud computing security and management issues.
- Differentiate between proprietary and open source cloud vendors.
- Demonstrate the use of virtualisation and cloud applications.

Evidence Requirements for the Unit

Candidates will need to provide evidence to demonstrate theoretical and practical knowledge of their Knowledge and/or Skills in a final report that will cover the following:

- Identify and describe types of IT resources
- Identify and describe cloud components
- Describe the concepts of virtualisation
- Identify and differentiate between cloud services
- Identify and differentiate between public, community, private and hybrid clouds
- Identify the cost benefits of cloud computing
- Identify and describe cloud computing security and management issues
- Differentiate between proprietary and open source cloud vendors
- Demonstrate the use of virtualisation and cloud applications

Please refer to the Guidance on Assessment at the end of this unit for more information on the final report end product.

Unit specification: support notes

Unit title: Cloud Computing

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this unit

The content of this unit is aimed at providing the candidate with a broad knowledge base in the essentials of cloud computing along with conceptual understanding of the elements associated with cloud computing.

There are three outcomes to this unit each of which is designed to introduce the candidate to different aspects of cloud computing:

1 Identify and describe cloud computing fundamentals:

- Different types of hardware and software resources that would lend themselves to the cloud
- The different types of components found in the cloud: software, application, platform, infrastructure, server
- The concepts of virtualisation: hardware, software, desktop, network, memory

2 Identify and describe different cloud delivery and deployment models:

- Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS)
- Public, private, community and hybrid models.

3 Devise and implement a cloud strategy for a small to medium-sized enterprise:

- Identify the cost benefits of migrating to the cloud
- Identify security and management issues in the cloud: privacy and data protection, policies, backups, cloud scalability
- Differentiate between proprietary and open source cloud vendors
- Demonstrate the use of virtualisation and cloud applications

Although the unit is expressed in generic terms, it should be related to a real-world context that will be familiar to candidates.

Guidance on the delivery of this unit

During the delivery of this unit it is important that every opportunity is taken to introduce real-world examples, opportunities for whole-class and group discussion and practical demonstrations wherever possible.

Concepts and terminology should be presented in context throughout the unit. Video presentations should be used where appropriate for providing an alternative explanation of a difficult topic, or as a focus for class discussion or group work. Wherever possible theoretical learning should be re-enforced using practical demonstrations, for example to demonstrate the use of particular applications and tools.

Given the theoretical nature of this unit, it is intended that a proportionate amount of time will be made available as a central part of the course for revision, tutorials and formative assessment exercises. Candidates should be strongly encouraged to undertake further reading, opportunities for individual or group research should be provided.

For practical purposes candidates should be exposed to up-to-date cloud computing applications and services, for example:

- Email and office applications: *Google Mail/Docs, zoho*
- Document storage facilities: *Box.net*
- Desktops: *cloudme web desktop*
- Open source Infrastructures and virtualisation: *openstack, opennebula*
- Proprietary services: *Amazon EC2, Microsoft Azure*

Guidance on the assessment of this unit

Assessment for this unit should take the form of a report of approximately 1,000 words based on a single case study, whereby the candidate is presented with a scenario that involves a small to medium-sized company researching for and devising a strategy for moving to the cloud.

For Outcomes 1 and 2, candidates should produce evidence as part of their report that they have carried out research into each of the areas found within the knowledge and skills sections.

Outcome 3 candidates should produce evidence as part of their report that they have carried out research into each of the areas found within the knowledge and skills sections, as well as demonstrating practical knowledge of cloud computing (as part of a solution) through the use of email/office applications, storage facilities, cloud desktops and cloud/virtualisation infrastructure (using open source tools).

Candidates should make reasonable recommendations as part of the report with regards to the strategy for moving to the cloud.

Assessment guidelines

Outcome 1
Outcome 1 is aimed at introducing the candidates to the fundamentals of cloud computing, including the identification of IT components and how they map to hardware and software elements found in the cloud. Candidates are also asked to identify the basics of virtualisation.

Outcome 2
Outcome 2 is geared more towards the operational aspects of cloud computing and introduces candidates to the different cloud computing services and how they are deployed.

Outcome 3
Outcome 3 deals with candidates devising a strategy for moving to the cloud, examining the security and management aspects of cloud computing, identifying cloud vendors as well as demonstrating the practical elements of cloud computing.

Candidates will be required to produce a 1,000 word report detailing research findings, cost benefits and a strategy for migrating to the cloud.

Online and distance learning
If this unit is delivered by open or distance learning methods, additional planning and resources may be required for candidate support, assessment and quality assurance. A combination of new and traditional authentication tools may have to be devised for assessment and re-assessment purposes.

Opportunities for developing Core Skills
There is no automatic certification of Core Skills or Core Skill components in this unit.

Equality and inclusion
This unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

History of changes

Version	Description of change	Date

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of SQA Advanced Qualifications.

FURTHER INFORMATION: Call SQA's Customer Contact Centre on 44 (0) 141 500 5030 or 0345 279 1000. Alternatively, complete our Centre Feedback Form.

General information for candidates

Unit title: Cloud Computing

The content of this unit is aimed at providing you with a broad knowledge base in the essentials of cloud computing along with conceptual understanding of the elements associated with cloud computing.

Outcome 1 is aimed at introducing you to the fundamentals of cloud computing, including the identification of IT components and how they map to hardware and software elements found in the cloud. You are also asked to identify the basics of virtualisation.

Outcome 2 is geared more towards the operational aspects of cloud computing and introduces you to the different cloud computing services and how they are deployed.

Outcome 3 deals with you devising a strategy for moving to the cloud, examining the security and management aspects of cloud computing, identifying cloud vendors as well as demonstrating the practical elements of cloud computing.

On completion of this unit, you should be able to:

1 Identify and describe cloud computing fundamentals.
2 Identify and describe different cloud delivery and deployment models.
3 Devise and implement a cloud strategy for a small to medium-sized enterprise.